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LECTURES
ON
DIET AND REGIMEN:
BEING
A SYSTEMATIC INQUIRY
INTO THE MOST RATIONAL MEANS OF PRESERVING
HEALTH AND PROLONGING LIFE:
TOGETHER WITH
PHYSIOLOGICAL AND CHEMICAL EXPLANATIONS,
CALCULATED CHIEFLY
FOR THE USE OF FAMILIES,
IN ORDER TO BANISH THE PREVAILING ABUSES
AND PREJUDICES IN MEDICINE.

BY A. F. M. WILLICH, M. D.

Qui stomachum regem totius corporis esse
Contendunt, vera nite ratione videntur:
Hujus enim validus tenor firmat omnia membra: ...
At contrà ejusdem franguntur cuncta dolore.
SERENUS SAMMONICUS,
De Medicina Præcepta saluberrima.

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LECTURES

ON

DIET AND REGIMEN.

CHAP. VII.

Of Food and Drink ;—their Quantity, Quality, Proportion to each other, Time of taking them, &c.—Of SPICES.—A Classification of the most usual alimentary Substances, according to their individual Effect on Health.

ALTHOUGH it be certain, that animal life could not be supported without food and drink, few individuals give themselves the trouble of reflecting, how the very important function of assimilating our aliment is accomplished. That office of the stomach, by which all living creatures are supported, deserves the attention of every inquisitive mind. Were I not confined in my plan to the relative salubrity of Food and Drink, without entering into physiological disquisitions, how the digestive organs prepare and conduct the food from one stage to another, till it is converted into chyle, and from that into blood, I might amuse my readers with a variety of speculations and

theories, none of which are fully established ; but such digressions, however entertaining or gratifying to curiosity, would be of little service, either in making the proper choice of aliment, or in ascertaining its wholesome or pernicious qualities.

If, in the early periods of society, when men subsisted upon roots, plants, and animal food, as they were promiscuously found, people did not reflect upon the relative salubrity of things, we have no right to censure them ; as they often might have been starved, before they could have discovered their qualities. But if we, in our present state of knowledge, neglect such inquiries ; if we indiscriminately feed on whatever is presented to our palate ; such conduct deserves severe animadversion. For, if man assume the right of calling himself Lord of the Creation, it is a duty incumbent on him, to make himself acquainted with the nature and properties of those substances, which so essentially contribute to animal existence.

Hence it may be justly asked, what are the constituent parts of aliment—how are they to be distinguished—are they of different kinds, or do they, with all the difference of form and taste, still manifest the same properties, powers, and effects—do they promiscuously supply all the parts of the human body, or are particular kinds of food more or less adapted to supply the wants of different parts of the body—and lastly, have all substances, we make use of as food, an equal share in this *nutritive principle*?

Such are the questions, which must arise in every reflecting mind ; and as the preservation

of the body depends so much on the manner in which the continual waste is supplied, it is a matter of the first consequence, to choose the substances which are most congenial to the different states and conditions of the body.

An eastern Dervise was once asked by a wealthy Mahometan, "Of what service to society is an order of men, who employ themselves in speculative notions of divinity and medicine?"—"If you were more cautious and temperate in your meals," answered the Dervise; "if you would learn to govern your passions and desires, by a due attention to abstinence, you all might be sages, and have no occasion for Dervises among you. But your appetite and aliment impair your understandings!"

In the consumption of food and drink we are liable to commit errors, both as to their quantity and quality. The error in the quantity, however, is generally the most detrimental. A small portion of food can be better digested and more easily prepared into chyle, or that alimentary fluid, from which the blood derives its origin, than a large portion of food, which injures the coats of the stomach, and prevents them from exerting their force. Hence every satiety, or superfluity, is noxious.

It is in infancy, and early age, that the foundation is laid for the many diseases arising from indigestion, which are now found in almost every family. If children are fed immoderately, and beyond the real wants of nature, the first passages become too much distended, and their stomach by degrees acquires an un-

natural craving for food, which must be satisfied, whatever be the consequence. These excessive supplies not only are unnecessary, but produce the most serious and fatal disorders. There is a certain relation subsisting between what is taken in, and what is lost by the body : if we eat and drink much, we likewise lose much, without gaining any more by it, than we might do by moderate meals. For that which affords the alimentary particles, is as it were drowned by the current ; and muscular energy is not only decreased, but in a great measure destroyed. Yet eating too little would be going to the opposite extreme, weaken the growth to bodily perfection, and eventually diminish the digestive power of the stomach, by depriving it of its due share of exercise and support.

Nature is easily satisfied, and is always best provided, if we do not intrude upon her more than she is accustomed to. If we have, for some time, taken little nourishment, nature becomes so habituated to it, that we feel indisposed, as soon as the usual measure is transgressed ; and both the stomach and its digestive powers are thereby impaired.

The hardy countryman digests the crude and solid food, at which the stomach of the luxurious citizen recoils. In order to strengthen the stomach, we ought not to withhold from it what keeps it in proper exercise. But, for this purpose, we should rather improve the quality, than increase the quantity of alimentary substances. It is with this organ as with all other parts of the body : the more exercise

we give it, the more strength and vigour it acquires. Hence, it is highly improper to leave off eating food of difficult digestion, as some people are apt to do ; for this is not the way of improving the energy of the body.

It would be a fruitless and impracticable attempt, to lay down fixed rules, by which the respective salubrity or perniciousness of every species of aliment might be determined, in its application to the individual. It has been before observed, that such rules do not exist in nature ; and that the particular state and condition of the person, time, and circumstances, must serve as our guide. Hence it may be considered as a general rule, that all incongruous mixtures and compositions, for instance milk and vinegar or other acids, or milk and spirits, are hurtful, by generating an acid and acrid whey in the stomach, and at the same time producing an indigestible coagulated mass.

Having premised these introductory remarks, I proceed to treat

Of Food in particular.

1. *As to its quantity.* A much greater number of diseases originate, upon the whole, from irregularities in eating, than in drinking ; and, in the latter respect, we commit more frequent errors with regard to quantity, than quality : otherwise the heterogeneous mixture of provisions, with which we load our stomachs, would disagree with all. This indeed but too often happens. One who eats slowly,

and a little only of a variety of dishes, will less injure his stomach than another, who eats immoderately of one or two favourite articles, and partakes of the others only for the sake of custom, or as a compliment paid perhaps to a fair hostess.—The gastric juice which is generated in the stomach, is capable of dissolving and digesting the most diversified materials, provided they be not unsuitably mixed; and a perfectly healthy stomach can prepare a chyle, or a milky fluid, of the same nourishing principle, from all eatable substances whatever.

The general rule then is, *to eat as much as is necessary to supply the waste suffered by the body*; if we transgress this measure, we produce too much *blood*; a circumstance as detrimental, though not so dangerous to life, as that of having too little. If we were never to trespass the due limits of temperance, our natural appetite would be able accurately to determine, how much food we might consume, without diminishing our vivacity. But, from the usual physical education of children, this can scarcely be expected in adults. We ought therefore to pay strict attention to the state of those intestines, which serve to prepare the alimentary fluid; and when these are in a relaxed or diseased state, we should instantly begin to be more moderate in eating.

There are three kinds of *appetite*: 1st, The *natural* appetite, which is equally stimulated and satisfied with the most simple dish, as with the most palatable; 2d, The *artificial* appetite, or that excited by stomachic elixirs, liqueurs,

pickles, digestive salts, &c.; and which remains only as long as the operation of these stimulants continues; 3d, The *habitual* appetite, or that by which we accustom ourselves to take victuals at certain hours, and frequently without a desire of eating.—Longing for a particular food is likewise a kind of false appetite.—The *true* and *healthy* appetite alone can ascertain the quantity of food proper for the individual: if in that state we no longer relish a common dish, it is a certain criterion of its not agreeing with our digestive organs. If after dinner we feel ourselves as cheerful as before it, we may be assured, that we have taken a *dietetical* meal. For, if the proper measure be exceeded, torpor and relaxation will be the necessary consequence; our faculty of digestion will be impaired, and a variety of complaints gradually induced.

The stomach being distended by frequent and violent exertions, will not rest satisfied with the former quantity of food;—its avidity will increase with indulgence in excess; and temperance alone can reduce it to its natural state, and restore its elasticity. Fulness of blood, and corpulency, are the disagreeable effects of too much eating; which progressively relaxes the stomach, and punishes the offender with headach, fever, pain in the bowels, diarrhœa, and other disorders.

The more suddenly this expansion takes place, the more forcibly and dangerously it affects the stomach; and its fibres, being too much extended, are the more sensible of the subsequent relaxation. Slow eating, therefore,

preserves the fibres in a due state of elasticity. Hence, *to eat slowly*, is the first maxim in Dietetics: the stomach suffering in this case but a very gradual distension, as the food has sufficient time to be duly prepared by mastication. He who observes this simple rule, will feel himself satisfied, only when he has received a due proportion of aliment. But he who swallows his food too quickly, and before it is perfectly chewed, will imagine he has eaten enough, when the unmasticated provisions occasion a sense of pressure on the sides of the stomach.—The teeth are designed by nature to grind our food, and to mix it with the saliva, produced by innumerable glands, and destined to promote its solution.

A healthy appetite is also determined by the season, to the influence of which the stomach is exposed, in common with the other viscera. Hence heat, in general, relaxes and exhausts the body, from its tendency to dissipate the fluids, or to diminish their quantity; and consequently the stomach cannot digest the same portion of food in summer, which it does in winter. There are however persons, who have the strongest appetite, and possess the most vigorous digestive powers, in the extreme heat of summer. The bile of such individuals is of a watery consistence, and too sparingly secreted; a defect, which is best remedied by heat. Those who take more exercise in winter than in summer, can also digest more food. But as individuals leading a sedentary life usually suffer in winter from a bad state of digestion, owing to a want of exercise, they ought to take less food in that season.

We call those substances *nutritive*, which restore and supply what has been wasted. They conduct to the body homogeneous or assimilated parts, by means of the intestinal canal, and by changing these parts into muscular substance or flesh, or into the fluid form of blood. Since some alimentary articles communicate their nutritive element sooner than others, as they contain coarser or more delicate particles, which according to their nature are more or less apt to be assimilated with the body, it follows, that all of them cannot be equally nourishing.

Too little aliment debilitates the body, which thereby acquires less than it loses by respiration; it hastens the consumption of life; the blood becomes inert and rarefied; or is rendered acrid and liable to putrefaction. After long fasting the breath is fetid, and the animal body becomes disposed to putrid fevers.—We can more easily digest a heavy meal, in four hours of accelerated respiration and muscular action during the day, than in eight hours of sleep. This circumstance has led mankind to make their principal meal about the middle of the day. A person who sits up five or six hours after supper, will feel himself much more inclined to take a second supper, than to go to bed.

Abstinence readily induces putrid diseases: a fasting of twenty-four hours is followed with a disgust and aversion to food, which of itself is a symptom of putrescency, and is at length succeeded by delirium.—After taking for some time too little food, the body is enfeebled;

the vessels are not sufficiently supplied ; their action on the whole mass of the blood, and of the blood on the several vessels, is interrupted ; its free circulation is checked ; and the smaller vessels corrugate, so that the thinnest blood is no longer capable of pervading them, as is the case in old age. When a person has suffered so much from extreme hunger, that his fluids are already in a putrescent state, much food must not be given him at once ; for his contracted stomach cannot digest it. Such a body must be supported with liquid nourishment, in small quantities, and be treated altogether like a patient in a putrid or nervous fever. Hence, no animal food of any kind, but subacid vegetables alone, can be given with propriety.

2. *As to the quality of aliment*, we must here investigate the nature of *Digestion*. This function may be aptly divided into two different processes : *Solution* and *Affimilation*. Solution takes place in the stomach, where the food is changed into a pulp, where it is dissolved according to its greater or less solubility, and where its nourishing particles are absorbed. Affimilation only begins, when the solution has already taken place in the stomach, when the nutritive substance, or the alimentary juice, is inhaled by the absorbent vessels, and conducted to the blood, by means of the lacteals. Affimilation, therefore, is that function, by which the aliment is as it were animalized : and hence it has been conjectured, that animal food is easier digested than vegetable, as being more analogous to our nature, and more easily converted into animal fluids.

There are articles of easy and of difficult digestion, in the animal as well as in the vegetable kingdom : in both we find some substances, which are completely indigestible, and which pass through the alimentary canal, without affording any nourishment.

The most simple dishes are the most nourishing. The multiplied combinations of substances, though they may please the palate, are not conducive to health. All substances containing much jelly, whether animal or vegetable, are nourishing ; for this alone affords nutriment ; and the hard, watery, and saline particles of food cannot be assimilated or converted into chyle. Nourishing substances would, indeed, be more conformable to Nature ; but, as our appetite generally incites us to eat somewhat more than is necessary, we should acquire too much alimentary matter, and become too full of blood, if we were to choose only such articles of food as contain a great quantity of jelly.

Dr. BUCHAN very justly observes, that “ the great art of preparing food is to blend the nutritive part of the aliment with a sufficient quantity of some light farinaceous substance, in order to fill up the canal, without overcharging it with more nutritious particles than are necessary for the support of the animal. This may be done either by bread or other farinaceous substances, of which there is a great variety.” Those, who are not employed in hard labour or exercise, do not require such nourishing food as those, whose nutritive fluids are in part consumed by muscular exertions and violent perspiration.

Such as have suffered frequent losses of blood, from whatever cause, will best restore it by strong aliment ; which, on the contrary, ought to be avoided by the plethoric. Those, lastly, whose frame is weakened and emaciated by irregularities and dissipation, should not attempt to eat much at a time, but rather repeat their meals more frequently, at proper and regular intervals.

Whether we ought to make use of articles of easy or difficult digestion, cannot be determined by general rules : every person must attend to the effects, which substances of different degrees of digestibility produce on his stomach. The chyle, when prepared of substances not easily digestible, is solid and concentrated, and consequently affords a substantial muscular fibre : but such substances as the stomach cannot digest, ought never to be used as food.

It is an important rule of diet, *to eat if possible of one kind of meat only*, or, at all events, *to eat of that dish first which is the most palatable*. The stomach is enabled to prepare the best chyle from simple substances, and will thence produce the most healthy fluids. And if we follow the second part of this rule, we are in no danger of overloading the stomach. At a table dietetically arranged, we ought to begin with those dishes which are most difficult to be digested, and finish our meal with the most easy ; because the former require stronger digestive powers, and more bile and saliva, all of which become defective towards the end of a heavy meal. The power of di-

gestion in the stomach is undoubtedly most vigorous and active, when that organ is not too much distended ; and the more coarse substances also require a longer time for being duly assimilated.

To begin meals, as the French, Germans, and Scots generally do, with *soups* or *broths*, is highly improper and noxious. These liquid dishes are ill calculated to prepare the stomach for the reception of solid food ; as they not only weaken and swell it by their bulk and weight, but also deprive it of the appetite for the succeeding part of the dinner. Every tension is attended with relaxation, so that we imagine ourselves satisfied sooner than we are in reality. Besides, broths and soups require little digestion, weaken the stomach, and are attended with all the pernicious effects of other warm and relaxing drinks. They are beneficial to the sick, to the aged, and to those who, from the want of teeth, have lost the power of mastication ; but for such persons they ought to be sufficiently diluted, and not too much heated with spices ;—otherwise they will be digested with some difficulty.

Many individuals are accustomed to spend the whole forenoon without breakfast, and feel no inconvenience from it, while others of a more delicate stomach could not bear such abstinence, without unavoidable cravings and debility. The business of digestion is usually accomplished within three or four hours after a meal ; hence the stomach is empty at rising in the morning, and the body often enfeebled by long fasting. Our breakfast should there

fore consist of more solid and nourishing substances, than are now generally used for that meal ; especially if our dinner is to be delayed till the late hours which modern fashion prescribes. We should breakfast soon after we get up, dine about mid-day, and not protract the hour of supper till the time which Nature points out for rest

A principal rule of diet is to take food with an easy and serene mind ; hence it is preferable to dine or sup in company : our food has thus more relish, it agrees better with us, and we eat more slowly and cheerfully. But we ought not to indulge ourselves in sitting too long at table, which is always pernicious to health. For digestion takes place, even while we sit at table ; and as the stomach, when gradually supplied, craves for additional quantities of food, especially when a variety of palatable dishes stimulates the appetite, we ought to be much on our guard against these seductions. Hence it is most advisable to make our dinner on one or two dishes ; because we can eat more of a plurality of dishes than of one or two only, and do not so easily perceive when the stomach is overloaded.—To read, or otherwise exercise the mind, during the time of eating, is likewise improper.

Gentle exercise, before dinner or supper, is very conducive to increase our appetite, by promoting the circulation of the blood. But too violent exercise impairs the appetite, and weakens the powers of the stomach, by means of its sympathy with the other parts of the body. In proof of this, we seldom see peo-

ple worn out with fatigue able to partake of their usual repasts. The exercise, however gentle, ought to be over at least half an hour before dinner ; because it is hurtful to sit down to table immediately after great fatigue.

As to our conduct *after dinner*, it is scarcely possible to give rules that are generally applicable, and much less so to every individual. From the contradictory opinion of the most esteemed authors, they appear not to have discriminated between the various states and conditions of animal life ; and as exercise was found to agree with some constitutions, and to disagree with others, a diversity of opinions necessarily arose among those who were so passionately fond of reducing every thing to general rules. In order then to remove these difficulties, I think it necessary to observe, that though it be apparently consistent with the instinct of nature to rest some time after dinner, according to the example of animals, yet this time, as well as other concurrent circumstances, deserves to be more precisely determined.

As soon as the food has entered the stomach, the important office of digestion begins : the vigour of the organs exerted on this occasion ought certainly not to be abridged by violent exercise ; but muscular and robust people feel no inconvenience from gentle motion about *one* hour after the heaviest meal. On the contrary, it is highly probable that the abdominal muscles receive additional impetus, by exertions of a moderate kind. But as the whole process of digestion is of much longer duration

than is generally imagined, the afternoon hours cannot be employed advantageously to health, in any labor requiring strong exertions.

The transition of the alimentary fluid into blood, which takes place in the third or fourth hour after a meal, and in some people of a weak and slow digestion much later, is always attended with some increase of irritability, which, in persons of great sensibility, may degenerate into a painful sensation or illness. At this time, therefore, nervous and hypochondriac persons are frequently troubled with their usual paroxysms ; they are seized with anguish, oppression, and an inclination to faint, without any external cause. Persons in this condition of body, as well as all febrile patients, and especially those who are troubled with stomachic complaints, would act extremely wrong and imprudent, to undertake any exercise whatever, before their victuals be completely digested ; as during digestion all the fluids collect towards the stomach. In violent exercise, or in an increased state of perspiration, the fluids are forced to the external parts, and withdrawn from the stomach, where they are indispensable to assist the proper concoction.

As to the propriety of *sleeping after dinner*, we may learn from those animals, which sleep after feeding, that a little indulgence of this kind cannot be hurtful. Yet this again cannot be established as a general rule among men. For the animals which sleep after food, are for the most part supplied with articles of

so very difficult digestion, and so hard in their nature, that great digestive powers are required to convert them into alimentary matter. Hence this practice can be recommended only to the nervous and debilitated, to weakly persons in general, who are much employed in mental exercise, and are past the middle age—especially after a heavy meal, in hot weather, and warm climates.

Experience, however, teaches us, that, in this respect, a short sleep, of a few minutes only, is sufficient and preferable to one of longer duration; for, in the latter case, we lose more by an increase of insensible perspiration, than is conducive to digestion.—But the position of the body is far from being a matter of indifference. The best is a reclined and not a horizontal posture, from which head-ach may easily arise, when the stomach presses upon the subjacent intestines, and the blood is thereby impelled to the head. The old practice of standing or walking after dinner is so far improper, as it is hurtful to take exercise, while the stomach is distended by food, the sensation of which lasts at least for one hour.

In the primitive ages, people subsisted chiefly upon plants and fruits. Even to this day, many sects and whole nations, the Bramins for instance, abstain from the use of animal food. The ancient Germans, also, who were so renowned for their bodily strength, lived upon acorns, wood apples, sour milk, and other productions of their then uncultivated soil. In the present mode of life, here as well as on the Continent, a great propor-

tion of the poorer class of country-people subsist chiefly on vegetables ; but although they duly digest their vegetable aliment, and become vigorous, yet it is certain, that animal food would answer these purposes much better. Hence in countries where the labouring class of people live principally upon animal food, they far excel in bodily strength and duration of life.

A popular writer observes, that “ animal food is less adapted to the sedentary than the laborious, whose diet ought to consist chiefly of vegetables. Indulging in animal food renders men dull and unfit for the pursuits of science, especially when it is accompanied with the free use of strong liquors.” This is so far true, but Dr. Buchan ought to have added, that the infirm, and those who labour under complaints of indigestion, will suffer still more from the use of vegetable substances, which by their peculiar nature produce too much acid, and require stronger digestive organs, in order to be changed into a good alimentary fluid.

Dr. Buchan farther observes, that “ consumptions so common in England, are in part owing to the great use of animal food.” To this assertion no one will give his assent, who is acquainted with that class of men, who carry on the business of butchers, among whom it is as rare to hear of a consumptive person, as it is to find a sailor troubled with the hypochondriasis. I must quote another observation of this gentleman, to which I cannot implicitly subscribe. Having remark-

ed, that the most common disease in this country is the scurvy ; that we find a taint of it in almost every family, and in some a very deep taint, he says,—“ that a disease so general
“ must have a *general cause*, and there is *none*
“ *so obvious*, as the great quantity of animal
“ food devoured by the natives. As a proof,
“ that scurvy arises from this cause, we are in
“ possession of no remedy for that disease equal
“ to the free use of fresh vegetables.” He likewise remarks, “ that the choleric disposition of the English is almost proverbial,
“ and if he were to assign a cause of it, it
“ would be their living so much on animal
“ food ;” and finally, that “ there is no doubt
“ but this induces a ferocity of temper unknown to men, whose food is chiefly taken
“ from the vegetable kingdom.”

There is much truth mingled with much fallacy in these assertions. I will allow, that animal food predisposes people to scorbutic complaints, and that it renders men more bold and sanguinary in their temper ; but there are a variety of other causes which produce a similar effect. Nor are the English so choleric a people as the Italians and Turks, both of whom, though sparing in the use of animal food, are uncommonly vindictive. It is farther not to be imputed to the consumption of flesh-meat, or the want of vegetables alone, that the scurvy is so frequent in this country, both on land and at sea. There appears to me to exist a powerful cause, to which people pay very little attention, and from which the scurvy more frequently derives its origin than from

any other ; the difference of food being in fact only a concurrent cause.

If we consider the very sudden and frequent changes of temperature in our climate ; if we compare the present mode of living with that of our ancestors, who did not interrupt the digestion of one meal by another, such as our rich luncheons in the forenoon, and our tea and coffee in the afternoon, when the digestive organs are, as it were, drowned in these favourite liquids ;—if, farther, we reflect upon the irregular manner in which our time of repose is arranged, so that we spend a great part of our life in the unwholesome night-air, partly at late suppers, and partly in the modern practice of travelling at night ;—if all these circumstances be duly weighed, we cannot be at a loss to discover a more general cause of scorbutic complaints, than that of eating too much animal food.

After these reflections, it will not be difficult to comprehend, that the most important of the human functions is materially injured, by these habitual irregularities. I allude to the *insensible perspiration* which is so far from being encouraged and supported by such conduct, that the noxious particles, which ought to be evaporated, are daily and hourly repelled, again absorbed by the lacteals, and reconducted to the mass of the circulating fluids. Here they can produce no other effect than that of tainting the humours with acrimonious particles, and disposing them to a state of putrescency and dissolution, which is the leading symptom of scurvy. Upon the minutest inquiries among sea-faring people, as well as the

inhabitants of the country, I have been informed, that those individuals, who pay due attention to the state of their skin, by wearing flannel shirts and worsted stockings, and by not exposing themselves too often to night-air, or other irregularities, are seldom, if ever, troubled with scurvy.

To return to the subject of animal food and its effects, it deserves to be remarked, that a too frequent and excessive use of it disposes the fluids to putrefaction, and, I believe in some sanguine temperaments, communicates to the mind a degree of ferocity. Nations living chiefly upon the flesh of animals, like the Tartars, are in general more fierce than others; and the same effect is manifest in carnivorous animals: they emit a very disagreeable smell, and both their flesh and milk has an unpleasant and disgusting taste. Even a child will refuse the breast, when its nurse has eaten too much animal food. Those who eat great quantities of meat, and little bread or vegetables, must necessarily acquire an offensive breath. It appears, therefore, to be most suitable and conducive to health, to combine animal with vegetable food, in due proportions. This cannot be minutely ascertained, with respect to every individual; but, in general, two thirds or three fourths of vegetables, to one third or fourth part of meat, appears to be the most proper. By this judicious mixture, we may avoid the diseases arising from a too copious use of either. Much, however, depends on the peculiar properties of alimentary substances, belonging to one or the other of the different classes, which we have now to investigate.

Of Animal Food.

It may serve as a preliminary rule, that *fresh meat* is the most wholesome and nourishing. To preserve these qualities, however, it ought to be dressed so as to remain tender and juicy; for by this means it will be easily digested, and afford most nourishment.

The flesh of *tame* animals is, upon the whole, preferable to *game*; and although the latter be, in general, more mellow, and easier of digestion, it does not contain the sweet jelly, and mild juices, with which the former is almost uniformly impregnated.

By the usual mode of dressing victuals, they lose a considerable part of their nutritious quality, and become thereby less digestible. *Raw meat* certainly contains the purest and most nourishing juice. We do not, however, eat raw flesh, but there are some substances which are frequently consumed in a state nearly approaching to that of rawness. Such are the Westphalia hams, Italian sausages, smoked geese, salted herrings, and the like.

Various modes of preparing and dressing meat have been contrived, to render it more palatable, and better adapted to the stomach. By exposure to the air, flesh becomes more soft, which obviously is the effect of incipient putrefaction; for, by this process, the volatile particles of ammoniacal salt are disengaged, and it is rendered more agreeable to the taste.

Pickled and smoked meats,* so commonly used in the northern and eastern countries of Europe, acquire an unnatural hardness, and communicate a great degree of acrimony to the fluids of the human body. By *boiling*, flesh is deprived of its nourishing juice, as the gelatinous substance of the meat is extracted, and incorporated in the broth; and it is thus converted into a less nutritive and more oppressive burden for the digestive organs; because the spirituous and balsamic particles are too much evaporated during the boiling. The *broth* indeed contains the most nourishing part of it, but it is too much diluted to admit of an easy digestion. A better mode of dressing meat is *roasting*, by which its strength is less wasted, and the spirituous particles prevented from evaporating; a crust is soon formed on its surface, and the nutritive principle better preserved. Hence, one pound of roasted meat is, in actual nourishment, equal to two or three pounds of boiled meat.

The boiling of animal food is frequently performed in open vessels; which is not the best method of rendering it tender, palatable, and nourishing: close vessels only ought to be used for that purpose. The culinary process called *stewing* is of all others the most profitable and nutritious, and best calculated to preserve

* It is remarkable, that *smoked meat* is more readily digested in a *raw* than boiled state. Experience affords ample proof of this assertion, especially in the articles of smoked hams and sausages; for the soft gelatinous fluids which, by the joint processes of pickling and smoking, have been effectually decomposed, or converted into a neutral substance consisting of ammoniacal salt combined with animal jelly, are completely extracted by boiling, so that little more than the dry fleshy fibres remain behind.

and to concentrate the most substantial parts of animal food.

When we expose articles of provision to the fire, without any addition of moisture, it is called *baking*. That such articles may not be too much dried by evaporation, they are usually covered with paste. Thus the meat, indeed, retains all its nutritive particles, becomes tender and easily digestible; but the paste is the more detrimental to the stomach, as it generally consists of an undue proportion of butter, which cannot be readily digested in that state. When meat is *fried*, it is in some degree deprived of its substance; but, if the fire be strong enough, a solid crust will soon be formed on its surface, by which the evaporation will be checked, and the flesh rendered mellow: the butter, or other fat used to prevent its adherence to the pan, gives it a burnt or empyreumatic taste, and renders its digestion in the stomach rather difficult.

Vegetables are, in general, not so readily digested, as even hard and tough animal substances; which from their nature are more speedily assimilated to the body; but the flesh of young animals, with a proportionate quantity of wholesome vegetables, is the diet best adapted to our system. The flesh of fattened cattle is by no means wholesome; these animals lead a sluggish and inactive life, and as they are surrounded in their dungeons by a bad and putrid air, they consequently do not afford fluids salutary for the stomach.

Though fat meat is more nourishing than lean, fat being the cellular substance of animal

jelly, yet to digest this oily matter, there is required, on account of its difficult solubility, a good bile, much saliva, and a vigorous stomach. To prevent any bad effects, we ought to use a sufficient quantity of salt, which is an excellent solvent of fat, and changes it into a saponaceous mass.

Luxury has introduced an unnatural operation, which makes the flesh of certain animals at once delicate and nutritious ; but the flesh of the same animals is still more wholesome in their unmutilated state, before they have been suffered to copulate. The mucilaginous and gelatinous parts of animals alone afford nourishment ; and according to the proportion of these contained in the meat, it is more or less nourishing. We find mucilage to be a principal constituent in vegetable, and jelly or gluten in animal bodies : hence farinaceous substances contain the most of the former, and the flesh of animals most of the latter. A substantial jelly, as for instance that of calf's feet, is more nourishing than a thin chicken broth ; but it is more difficult to be digested.

In summer, it is advisable to increase the proportion of vegetable food, and to make use of acids, such as vinegar, lemons, oranges, and the like ; the blood being in that season much disposed to putrefency. The man who continually takes nourishing food, is liable to become fat and plethoric ; while on the contrary the parsimonious, or the religious fanatic, from their abstinence, become thin and enfeebled : hence the medium, or a proper mixture of both

vegetable and animal nutriment, seems to be most conducive to health. I cannot sufficiently recommend the following caution to those who are frequently troubled with a craving appetite: the more food the stomach demands, it ought to be the more sparingly furnished with strongly nourishing substances, in order to avoid obesity, or fatness; and much vegetable food is in this case required, to counteract that disposition to putrescency, which the frequent eating of nutritive substances necessarily occasions.

There are people who feel the sensation of hunger in a painful degree, which generally arises from too much acid being generated in the stomach. A vegetable diet would be prejudicial to such individuals; they ought to increase the proportion of animal food; and dishes containing oily substances, in general, agree well with them. Bread and butter is useful to such persons, in order to neutralize their acid acrimony, and at the same time, to change the fat into a more soluble saponaceous substance. The cause of this acid is frequently a weakness in the stomach, which cannot be cured in any other manner, than by strengthening bitters, and articles of nourishment that are mildly astringent, and promote warmth in the intestines; and in this respect, cold meat, as well as drink, is preferable to hot.

The jelly of animals being the very substance, which renovates the solid parts, is obviously serviceable and necessary to nourish the human body. As, however, each kind of an-

imal has its peculiar jelly and fat, which can be nourishing only when assimilated to our nature by the digestive organs; and as the different parts of animals require different degrees of digestion, it will be necessary to enter into more minute inquiries, respecting these particulars.

Experience informs us, that the flesh and intestines of young animals afford a thin, easily digestible, and nutritive jelly. Old animals, hard and tough flesh, cartilages, sinews, ligaments, membranes, membranous thick intestines, and the sinewy parts of the legs, produce a strong and viscid jelly, which is difficult to be digested and assimilated to our fluids. The more healthy the animal is, the stronger will be the jelly, and the more nourishing its fluids. The most nutritious flesh is that of animals living in the open air, having much exercise and a copious mass of blood, and particularly, if they are kept in dry and warm places. The alkali contained in the flesh of carnivorous animals is the cause of the bad nourishment it affords, and of the injurious consequences attending its use. From the similarity in the structure of quadrupeds to that of man, it may be conjectured, that their jelly is similar to ours; that such as are fed upon milk give the best nourishment; and that the flesh of female animals is more easily digested, but less nutritious than that of the castrated males, which in every respect deserves the preference. After quadrupeds, we may class birds, in point of nourishment; then fishes; next to them amphibious animals; and lastly insects.

As animal food is strongly nourishing, it generates blood, fat, and spirituous particles, in a much greater quantity than vegetable aliment. The activity and courage of carnivorous animals prove, that the feeding upon flesh gives spirit and strength, heats the body, and preserves the muscles in a lively state. For these reasons, much animal food is improper for those of a full habit and abundance of blood, for febrile patients, and those who are disposed to hemorrhages or losses of blood. The phlegmatic, on the contrary, and those of thin watery fluids, and a weak digestion, may with safety eat more animal than vegetable food.—Of the different kinds of flesh, game is most heating; that of young domestic animals least; for instance, of calves and chickens, particularly when they are eaten with vegetable substances containing an acid, such as sorrel, asparagus, &c. That animal food disposes to putrescency, I have before remarked; hence it ought to be sparingly used in summer, and in hot climates. Persons, whose fluids already show a putrid tendency, and who are reminded of it by frequent eruptions of the skin, or who are already corpulent, should abstain from a too copious use of animal food.

I have also observed, that the flesh of carnivorous animals has an extraordinary tendency to putrefaction, as is obvious from their fetid perspiration; that it contains an acrimony and alkalescency foreign to our nature, and that it does not afford mild nutriment. The flesh of granivorous animal, partaking more of the vegeta-

ble principle, is less subject to putrefaction; and though it be less nourishing, and less abounding in spirituous particles than that of the former, yet it supplies us with a milder and more congenial aliment.

The flesh of fishes, being, like the element in which they live, most distinct from the nature of man, is of all others the least wholesome and nutritive.

The tame quadrupeds that suck the mother's milk, if they rest too much and are quickly fed, do not afford a good and well-prepared food. In animals, which have tender muscles and little exercise, those parts are probably the most wholesome which are more in motion than others, such as the legs and head.

Poultry furnishes us with the most valuable aliment, as it has excellent and well-digested fluids, from its more frequent exercise and constant residence in the open and pure air. Some animals, when young, have tough and spongy flesh, which is mollified and improved by age, and can be eaten only after a certain time, such as eels and carp. Others are hard when young, and must be used early, because that hardness increases with their age; as the haddock, and many other species of fish. The flesh of old animals, that have less muscular parts than the young ones of the same species, is indigestible; and we may lay it down as a general rule, that the more the flesh of an animal is disposed to putrefaction, it is the more unwholesome.

Veal, although affording less nutriment than the flesh of the same animal in a state of ma-

turity, contains many nourishing and earthy particles, and produces little or no disposition to flatulency: it ought, however, not to be brought to market, till the calf is at least six weeks old, and fed, if possible, on the mother's milk. Veal is not of a heating nature, and may therefore be allowed to febrile patients in a very weak state, especially with the addition of some acid;—it is also the most proper food for persons who have a disposition to hemorrhages. On account of the great proportion it contains of viscidities, persons disposed to phlegm and complaints of the abdomen, ought to abstain from its use. For these reasons, we recommend veal-broth, especially in pectoral and inflammatory diseases. The lungs, the liver, and the tongue of veal, are less viscous than the flesh; and being easily digested, soft, and mild, they are very proper for sick persons and convalescents. No animal fat is lighter than this; it shows the least disposition to putrescency; and it may therefore be used, in preference to any other, by persons of a scorbutic taint. The fat of veal should not be boiled; the operation of boiling softens its fibres too much, dissolves the jelly, and renders it unfit for digestion. But, by roasting, it becomes drier, and somewhat more solid; both the serous and thick parts of the blood are incrassated in the external vessels, the fibres are dried up, and a crust is formed, beneath which the fluids are moved, and changed into vapour, by the continued application of heat. In this operation all the fibres lie, as it were, in a vapour-bath, and are perfectly softened without losing

any of the jelly. Roasting, therefore, may be considered as the best mode of preparing this meat. Baking also forms a crust over it like roasting, but the fat incrassated by heat may occasion inconvenience, as it possesses an oily acrimony, and is with difficulty digested. For the same reason, it is improper to eat the burnt crust of any meat, of which some people are particularly fond, though it contains an empyreumatic oil, highly pernicious, and altogether indigestible by the stomach. For roasting, the mellow and juicy kidney-piece, or the breast of veal, deserves the preference: the leg is too dry and fibrous; it requires good teeth to be well chewed, renders the use of tooth-picks more necessary than any other dish, and is frequently troublesome to the stomach. In short, veal does not agree well with weak and indolent stomachs, which require to be exercised with a firmer species of meat. When boiled, it is but slightly nourishing, and when we make a meal upon veal alone, we soon feel a renewal of the cravings of the appetite. For removing the acid from the stomach, veal is the most improper article of diet. But to patients recovering from indisposition, first may be given veal-broth, then roasted veal, and lastly beef; the properties of which we shall now consider.*

Beef affords much good, animating, and strong nourishment; and no other food is

* A horrid custom has been introduced by luxury, of feeding calves cooped up in boxes so small as to prevent all motion, and from which light is totally excluded: by this cruel refinement their flesh is, by epicures, thought to be rendered more white and delicate; but if humanity does not revolt at this practice, those who have any regard for health should avoid the use of the flesh of an animal reared in this unnatural and putrescent state.

equal to the flesh of a bullock of a middle age. On account of its heating nature it ought not to be used, where there is already an abundance of heat ; and persons of a violent temper should eat it in moderation. It is peculiarly serviceable to hard-working men ; and its fat is nearly as easily digested as that of veal.

It deserves, however, to be remarked, that the tongue, the intestines or tripe, and the sausages made of beef are more difficult of digestion than the muscular part ; and that it would be extremely improper to give them to nurses, children, or lying-in women.

The meat of old bullocks, fed and kept in the stall, when unfit for labour, is scarcely digestible ; it is burdensome to the stomach, and contains, as well as that of old cows, (which is still worse) no wholesome fluids. Though beef be more frequently eaten boiled, yet it is more nourishing and digestible when roasted. Finally, beef is almost the only species of animal food, with which the stomach is not easily surfeited, and which is in proper season throughout the whole year.

Pork yields a copious and permanent nourishment, which does not disagree with the robust and laborious, but which, from its abundance of acrid fat, is not wholesome to persons of a weak stomach or sedentary life ; as these animals live and are fed in sties without exercise, and in an impure air. From the want of clean water, their flesh acquires a tough and strong consistence, and is indigestible but by a strong and healthy bile. Persons who have

impure fluids, and a tendency to eruptions, as well as those who have wounds or ulcers, should refrain from the use of pork ; for this food will dispose them to inflammation and gangrene : it is equally improper in a catarrhal state of the breast, in weak stomachs, coughs, and consumptions.

The antient physicians considered pork as the best and most nutritious meat, if supported by proper digestive powers. But they were certainly mistaken in this supposition ; for, although its quality is such as renders a smaller quantity of it necessary to satisfy the cravings of the stomach, yet veal and beef, taken in increased proportions, afford equal, if not more nourishment, and doubtless a more wholesome supply of animal jelly, than pork, under similar circumstances of the individual, would produce. By allowing these animals clean food, and the enjoyment of pure air and exercise, their flesh might be much improved in salubrity ; but the farmer is little anxious about the quality of the meat, if he can produce it in greater quantity, which he is certain to obtain from the present unnatural mode of feeding swine. People of delicate habits may sometimes eat pork sparingly ; but it is an erroneous notion that it requires a dram to assist its digestion ; for spirituous liquors may indeed prevent, but cannot promote its solution in the stomach. It would be much better to drink nothing after pork for a short time, as it is usually very fat, and this fat is more subtile and soluble than any other, and has nothing in it of the nature of tallow.

Pork, eaten in moderation, is easily digested. With those whose digestive organs are weak, no other species of meat agrees in general so well, as a small quantity of this. Hence the objections made against it relate more to the quantity than to the quality or substance; for if it be eaten in too great quantity, it is apt to corrupt the fluids, and to produce acrimony. We ought therefore to eat it seldom and sparingly, and the appetite which many people have for this food should be kept within moderate bounds. The most proper additions to pork, are the acidulated vegetables, such as gooseberry or apple-sauce; which not only gratify the palate, but correct its properties, neutralize, in a manner, its great proportion of fat, and thus operate beneficially on the alimentary canal.*

The flesh of *wild hogs*, as they have more exercise than the tame, and do not live upon substances so impure and corrupted, is more palatable, more easily digested, less tough, not so fat, and on account of their residence in the open air, is, like all game, purer, but more liable to putrefaction.

* There is little to be apprehended from the worms in swine, which, according to a late discovery of the celebrated Naturalist GÖRZE, in Germany, are natural to these animals. They reside in the cartilaginous vesicles of the liver, and when these vesicles burst in very hot weather, while the worms are yet extremely small, they pass into the blood with other fluids, and gradually increase in size. But there is no instance, that they have produced diseases, unless arising from disgust. Should it however, be found, that these animalculæ become visible externally, and in great quantities, the butchers ought not to be permitted to sell such hogs, as the flesh easily acquires an uncommon acrimony, is much disposed to putrify, and consequently, improper to be used as food.

Smoked hams are a very strong food. If eaten at a proper time, they are a wholesome stimulus to the stomach; but boiling them renders the digestion still more difficult.—In *salt-ing* any kind of meat, much of its jelly is washed away, the fibres become stiff, and thus heavier for the stomach. The salt penetrates into the jelly itself, prevents its solution in the alimentary canal, and consequently makes it less conducive to nutrition.—By *smoking*, the fibres of meat are covered with a varnish, the jelly is half burnt, the heat of the chimney occasions the salt to concentrate, and the fat between the muscles to become rancid; so that such meat, although it may stimulate the palate of the epicure, cannot be wholesome.

Sausages, whether fried or boiled, are a substantial kind of nourishment; they require, therefore, a strong bile to dissolve them, and a good stomach to digest them. They are not of an acrid nature, provided they have not too much pepper in their composition, and be closely filled, so as to contain no air. *Blood Sausages*, usually called Black Puddings, consisting of bacon and coagulated blood, which is totally indigestible, are a bad and ill-contrived article of food; and still more so, if they have been strongly smoked, by which process the blood becomes indurated, and the bacon more rancid: thus prepared, nothing can be more pernicious and destructive to the best fortified stomach. The spices usually added to sausages, correct, in some degree, their hurtful properties, but are insufficient to counteract the

bad and highly disagreeable effects of rancid substances.

Bacon is chiefly hardened fat, accumulated in the cellular texture under the skin, and is of all meat the most unwholesome; it easily turns rancid in the stomach, or it is so already by long hanging, and is particularly pernicious to those who are subject to the heartburn.

Lard, a softer fat collected from the entrails and the mesentary of hogs, becomes easily rancid, and is otherwise relaxing to the digestive organs: for which reasons, it is seldom used in English cookery.

The *mutton* of sheep fed on dry pastures is a better and more nourishing food than that of others reared in moist places. Those also fed upon the sea-shore are excellent meat, the saline particles which they imbibe giving at once consistency and purity to their flesh. The flesh of rams is tough and unpleasant, but that of ewes and still more that of weathers, is of a rich, viscous nature. Young mutton is juicy and easily digested, but it is rather tough, and has not that balsamic alimentary juice peculiar to sheep above a certain age. The best mutton is that of sheep not less than three, and not above six years old. Under three years of age, it has not attained its perfection and flavour.

A roasting piece of mutton ought to be exposed to the open air for several days, according to the weather and season; it affords then a palatable dish, which is easily digested, and agrees with every constitution. But the fat of mutton is almost indigestible; for it easily co-

agulates in the stomach, and oppresses that organ: hence the lean part of mutton is more nourishing and conducive to health.—The feet of this animal are nourishing, on account of their jelly, and are of great service for injections, in those diseases which originate from acrimony in the intestines.

Lamb is a light and wholesome food, not so nutritious as mutton, but extremely proper for delicate stomachs. The vegetables most proper to be eaten with lamb are those of an acidulated nature, as gooseberries, sorrel, and the like. It is fashionable to eat this meat when very young; but a lamb that has been allowed to suck six months, is fatter and more muscular, and in every respect better, than one which has been killed when two months old, and before it has had time to attain its proper consistency.

House Lamb is a dish, prized merely because it is unseasonable. Like all animals reared in an unnatural manner, its flesh is insipid and detrimental to health.

The flesh of *Goats* is hard, indigestible, and unwholesome; hence the meat of kids only is esculent, being more easily digested, and yielding a good nourishment.

The flesh of *Deer* (*Venison*), and that of *Hare*, contain much good nutriment; but, to the detriment of health, these animals are generally eaten when half putrified, though they are naturally much disposed to putrescency. When properly dressed, they afford a mellow food, and are readily assimilated to our fluids. But as wild animals, from their

constant motion and exercise, acquire a drier sort of flesh than that of the tame, it should never be boiled, but always ought to be roasted or stewed. From the same cause, the fluids of wild animals are more heating, and more apt to putrify, than those of the domestic. Persons, therefore, who already have a predisposition to scurvy or other putrid diseases, should not eat much game, particularly in summer. This pernicious tendency of game may be corrected by the addition of vinegar, acid of lemons, or wine; salad also is very proper to be eaten with it. Those parts of wild animals, which have the least motion, are the most juicy and palatable: the back, for instance, is the best part of a hare.

The *lungs* of animals contain nothing but air and blood-vessels, which are very tough, solid, difficult to be digested, and afford little nourishment. Besides, on account of the encysted breath, and the mucus contained in them, they are in reality disgusting. The *liver*, from its dry and earthy consistence, produces a vitiated chyle, and obstructs the vessels; hence it requires a great quantity of drink, and ought never to be used by the plethoric: the blood-vessels and biliary parts adhering to it, are particularly disagreeable. The *heart* is dry, scarcely digestible, and not very nourishing. The *kidneys* also are acrid, hard, tough, and not easily digested by the delicate. These intestines, however, of young animals, such as calves and lambs, produce aliment sufficiently wholesome.

The *fat* and *marrow* of animals afford, indeed, solid and elastic alimentary juice, increase the blood and fluids, but are difficult to be digested ; they require a powerful stomach, perfect mastication, sufficient saliva and bile, and agree best with persons who take much bodily exercise. If not duly digested, they occasion diarrhœa, weaken the stomach and the bowels, stimulate too much by their uncommon acrimony, and easily turn rancid, especially when eaten together with meat much disposed to putrefaction. They are apt to destroy the elastic power of the first passages, as well as of the whole body, to produce the heart-burn, cramp of the stomach, and head-ach, particularly in irritable habits, and, at length, to generate an impure and acrimonious blood.

The *blood* of animals is completely insoluble, consequently in no degree nourishing.

The *milk* is of very different consistence and properties, not only according to the different kinds and species of animals, but also in the same species, in consequence of the difference in feeding, constitution of body, age, time of milking, and so forth. Milk takes the lead among the articles of nourishment. It affords the best nutriment to persons whose lacteals and blood-vessels are too weak for deriving nourishment from other provisions ; because it is already converted into an alimentary fluid in the intestines of an animal.

Nature has appointed this nutritive substance, milk, as the food of children ; because infants, on account of their growth, require

much nourishment. From this circumstance, we may also conclude, that milk is easily digested by healthy stomachs, since at this early age the digestive powers are but feeble. Milk-porridge, however, as well as those dishes in the composition of which milk and flour are used, have a manifest tendency to obstruct the lacteals or milk-vessels of the intestines and the mesentary; a circumstance which renders them extremely unwholesome, particularly to children. Milk, although an animal production, does not readily undergo putrefaction; as it is possessed of the properties of vegetable aliment, and turns sooner sour than putrid. It affords a substantial alimentary fluid; and hence it is of service to persons enfeebled by dissipation or disease.

As the milk of animals contains more cream than that of the human breast, it ought to be diluted with water, when given to infants. It combines both saccharine and oily particles, and is a very serviceable article of diet, in a putrescent state of the blood, in inveterate ulcers, and in the scurvy. It is well calculated to assuage rigidity, cramps, and pains, being a diluent and attenuating remedy, *especially in the state of whey*; it promotes perspiration and evacuation in general, and is highly beneficial in spitting of blood, hysterics, hypochondriasis, dysentery, inveterate coughs, convulsive affections, the putrid sore throat, and in complaints arising from worms. Milk is also used for fomentations, baths, emollient injections, and washes for inflamed and sore parts. If intended as a medicine, it should be drunk immedi-

ately or soon after it comes from the cow. Through boiling, and even by long standing, the best and most nutritious balsamic particles evaporate.

The milk to be employed for diet in diseases ought to be taken from healthy and well-nourished animals; for we see in children how much depends on the health of the mother, and how suddenly they suffer from an unhealthy or passionate nurse. In Spring and Summer, the milk is peculiarly good and wholesome, on account of the salubrious nourishment of herbs. In Winter it is much inferior. It is farther necessary, that the animal furnishing the milk should be kept in the free air, and have daily exercise. In order to obtain good milk, it would be adviseable, for persons who have the opportunity, to keep a cow; for, besides the adulteration of that which is sold, cows are frequently milked at an improper time, by which the milk is much injured, and cannot be wholesome.

The best milk is obtained from the cow at three or four years of age, about three months after producing the calf, and in a serene Spring morning. Good cow's milk ought to be white, without any smell; and so fat, that a drop being allowed to fall on the nail will not run down in divisions. It is lighter, but contains more watery parts than the milk of sheep and goats; while, on the other hand, it is more thick and heavy than the milk of asses and mares, which come nearest the consistence of human milk. Ewe's milk is rich and nourishing; and it yields much butter, which is so

unfavorable, that it cannot be eaten. Both this and goat's milk produce much cheese, which is tough, strong, pungent, and difficult to be digested.

As goats are fond of astringent herbs, their milk is superior in strength to that of other animals; hence it has been sometimes used with the most happy success in hysterical cases. Goat's whey and ass's milk are chiefly used in pulmonary consumptions; where ass's milk cannot be got, that of mares may be used as a substitute.*

Milk consists of caseous, butyraceous, and watery parts; that which contains a well-proportioned mixture of the three, is the most wholesome. But this mixture is not always met with in due proportion—frequently the two first, namely, cheese and butter, predominate; and in this case it affords indeed a strong food, but is difficult of digestion. If the water form the greatest proportion, it is then easily digested, but less nourishing. This is particularly the case with ass's milk, which, more than any other, affects the urine and stool, while it has a tendency to purify the blood.

On account of the warmth, and the mechanical process of the digestive organ, joined to the chemical properties of the acid generated in it, milk necessarily coagulates in every stomach. The caseous part is dissolved, and diluted.

* *Artificial ass's milk*, not inferior in its properties to the natural, may be made by the following process:—Take of eryngo-root or sea-holly, and pearl barley, each half an ounce; liquorice-root three ounces; water two pounds or one quart; boil it down over a gentle fire to one pint, then strain it, and add an equal quantity of new cow's milk.

ed by the admixture of the digestive liquors, and thus prepared for being changed into a pure chyle or milky fluid. Indeed, it makes no difference, whether we take cream, cheese, and whey in succession, or whether we consume them united in the mass of the milk: in the former case, the separation takes place without, and in the latter within the stomach.

It is however improper to eat acid substances together with milk, as this mass would occasion fermentation and corruption: while, on the contrary, the natural coagulation is only a separation of the constituent parts, not a transition of this mild fluid into the stage of acid fermentation; for this is prevented by the saponaceous digestive liquors, though the milk itself be coagulated.

Yet milk is not a proper food for the debilitated, in all cases; nay, under certain circumstances, it may even be hurtful. It does not, for instance, agree with hypochondriacs; as it occasions cramp of the stomach, cholic, heartburn, and diarrhoea. Febrile patients, whose weak organs of digestion do not admit of nutritive food, and whose preternatural heat would too easily change the milk into a rancid mass, must abstain from it altogether. It disagrees also with the plethoric, the phlegmatic, and the corpulent; but particularly with tipplers, or those addicted to strong spirits. Its butyrous and cheesy parts may obstruct digestion and oppress the stomach.

Lastly, *sour milk* is unfit for use, on account of the chemical decomposition which has taken place in its constituent parts, and because it

can hardly be digested by the most powerful stomach: even sweet milk ought not to be eaten together with flesh meat, and in most cases the whey is preferable to the milk.

With these exceptions, milk is an excellent species of diet, which does not require strong digestive organs, unless a variety of other substances be eaten along with it. On the contrary, persons much reduced in bodily vigour have received benefit, and in a great measure been cured, by eating milk only. We daily observe that children at the breast, with the natural inclination to acidity and viscosity, feel its bad effects only, when, together with milk, they are fed upon cakes, pastry, gingerbread, and other trash. Milk being free from all acrimony, produces wholesome, light, and sweet blood. Sugar and salt are almost the only proper spices to be added to it.

Cream is exceedingly nourishing, but too fat and difficult to be digested, in a sedentary life.

Butter possesses at once all the good and bad properties of expressed vegetable oils; it is the sooner tainted with a rancid bitter taste, if it be not sufficiently freed from the buttermilk, after churning.—Bread and butter require strong and well-exercised powers of digestion.—It is a most pernicious food to hot-tempered and bilious persons, as well as to those of an impure stomach. The good quality of butter is marked by a very fat shining surface, yellow colour, agreeable flavor, and sweet taste.*

* I am disposed to think it would be beneficial to society, if the making of *butter* were strictly prohibited, as well as the impor-

Butter-milk is a species of whey, but contains a great number of butyrous particles. If we drink it while new and sweet, it is refreshing and cooling.

Before I quit the subject of milk, I cannot omit remarking, that this fluid, besides the qualities before enumerated, contains some spirituous parts, *in a latent state*, with which our chemists are little acquainted. And although these parts cannot be disengaged from the milk, and exhibited in a separate form, yet it is certain, that the Persians, and other inhabitants of the East, prepare a kind of wine from milk, which possesses all the properties of intoxicating liquors. Such is the report of respectable travellers; but I am inclined to suspect, that these Orientals make some addition to the sweet whey, after the caseous parts are separated from it, by which they induce a vinous fermentation. Whether they add honey, sugar, or any mucilaginous vegetable, containing the saccharine principle, I shall not attempt to decide: but it is well known, that the Chinese ferment and distil a liquor from a mixture of rice and veal, which is not unpleasant when new.

Cheese is obtained from the tough part of the milk, which subsides in coagulation, and which must be completely freed from the whey. All cheese is difficult to be digested,

ration of salt butter into every civilized country, where the hurtful properties of it are sufficiently understood.—*Mouldy* fat, or the *dressings* of baked and roasted meat is equally, if not more pernicious to the stomach than even stale butter, and both ought to be used only for greasing cart wheels, and not for injuring human organs.

being the coarsest and most glutinous part of the milk, which the healthy and laborious only can concoct in their stomach. To others, it is too heavy ; it imparts a thick and acrid chyle to the blood ; it hardens in a weak stomach, and accumulates an indurated earthy lump. When eaten new, in any considerable quantity, it corrupts the fluids ; and if old, it becomes putrid. In small quantities after dinner, it can do no great harm, but it is absurd to suppose that it assists digestion ; its effects, at best, being of a negative kind, that is, by producing a temporary stimulus on the stomach : and even this is the case only with sound old cheese which is neither too fat, nor too far advanced in the process of putrefaction.

Toasted cheese, though more agreeable to some palates than raw, is still more indigestible. Cheese, if too much salted, like that of the Dutch, acquires, when old, a pernicious acrimony. The green Cheese of Switzerland, which is mixed with a powder of the wild Melilot, or the *Trifolium Melilotus*, L., and the milder Sage-Cheeses prepared in England, are the almost only kind which may be eaten without injury ; and even these should be used in moderation.*

* To show the strongly viscid quality of cheese, and what powers of digestion it must require to assimilate it to our fluids, I shall mention a composition which may be useful, as the strongest cement yet contrived, for mending china cups, glasses, and the like. A piece of Cheshire or Gloucester cheese is boiled in three or four different waters, till it form a soft and elastic mass, freed of the whey and other extraneous ingredients. After having expressed all the water from this mass, and while yet warm, it must be gradually rubbed upon a piece of marble, such as is used by

Birds, as they move in the purest and most healthy atmosphere, possess the best prepared and most wholesome alimentary substance ; yet the flesh of birds, though more easily digested, is less nourishing than that of quadrupeds ; as on account of their constant exercise the whole winged tribe have drier muscles, consequently a less nutritious juice. Those birds particularly, which subsist upon worms, insects, and fishes, are not wholesome ; and if they frequent swampy and filthy places, their flesh will afford meagre and impure nourishment.

Some parts of fowls are less wholesome than others. The wings of those whose principal exercise is flying, and the legs of those that generally run, are the driest parts of their bodies : hence the breast is, in all, the softest and most nutritive part. Young poultry is preferable to that of some years old, which have very tough muscles, and are heavier to the stomach.

Birds living upon grain and berries are in all respects the best ; next, those feeding upon insects ; and last of all, that class of birds which preys and subsists upon fishes. These indeed, like all other animals, whose proper food is flesh, are eaten only by savage nations, wild and tame ducks and geese excepted ; which, by their strong flesh, and the inclina-

colour-men ; and as much unslacked or quick-lime in powder must be added, as will be absorbed by the cheese, without making it too hard. This compound forms the strongest possible cement ; if allowed to dry slowly, it is able to withstand fire as well as water.

tion of their fluids to putrescency, are less wholesome than any other bird. Water-fowl afford the least beneficial food. In general we find winged animals out of season in Spring; partly because most of them are then pairing, and partly on account of the long journeys of those that are birds of passage, by which they become leaner than at any other time of the year; yet some birds of passage do not arrive in this climate till towards Autumn.

It is remarkable, that most birds, when taken from their wild state, and fed in captivity, such as partridges, larks, and others, lose much of their peculiar flavour, which is also the case with wild quadrupeds. Yet those tame and domesticated fowls and animals, that are well fed in yards and stalls, are generally more fat and muscular than those which are obliged to seek their own food. Old fowls are the most serviceable for broth; or they might be boiled in close vessels, where they can macerate for some hours, till they are completely softened by the steam. Fowls lose much of their fine flavour, if boiled; they are therefore best roasted, except the smaller kinds, which ought to be baked.

All birds living upon grain and berries afford good nutriment, except geese and ducks. The flesh of the goose is unwholesome, especially when fed in small inclosures, without exercise; which practice is sometimes carried so far, as cruelly to nail the animal to a board through the feet, to prevent its motion. Its fat is almost totally indigestible: its flesh produces a very obvious and bad effect upon

wounds and ulcers. It is also pernicious to those who are disposed to inflammatory diseases, and to cutaneous eruptions.—A young hen, or chicken, is a very wholesome dish ; its vegetable aliment produces a mild and sweet chyle ; and the whiteness of its flesh shows its excellent quality. As it is easily digested, it is a dish to be recommended to the weak and debilitated ; and it agrees best with individuals of an acrid and mucous tendency, or such as are troubled with biliary and stomachic disorders.

The Capon is one of the most delicate dishes ; if eaten when young, he yields a strong and good chyle ; his flesh is not of a heating nature, is not disposed to putrescency, and the fat itself is easily digested. Turkeys, as well as Guinea or India fowls, yield a strong aliment, but are more difficult of digestion than the capon ; particularly the legs, wings and fat. These birds, when roasted, are usually filled with some kind of heavy pudding, which is a favourite morsel with many, but requires the strongest digestive powers.—The old prejudices, that the flesh of capons is productive of the gout, and that of sparrows brings on epileptic fits, are too absurd to require refutation.

Among the birds subsisting on insects, there are few eaten, except the various kinds of snipes and starlings. All of them, without exception, consist of hard, unsavoury, and scarcely digestible flesh.

It would be useless to enumerate the various birds living upon fish, which are eaten in other countries. They all have a taste of fish,

and afford a poor aliment. The ducks and geese only are eaten in Britain : of these the former afford the better nourishment, as they are generally not so abundantly fat as the latter, and are permitted to move about in the open air. But they ought not to be suffered to repair to stagnant waters, which they swallow, and which taint their fluids and flesh with qualities detrimental to health.

Next to milk, no nutriment is so simple and salutary as that of bird's eggs, among which those of hens justly deserve the preference, in respect of nourishment, taste, and digestion. The albumen, or the white of eggs, corresponds to our serum, or the water of the blood ; it is dissolved in a warm temperature, but considerable heat makes it hard, tough, dry, and insoluble. The yolk of eggs is more soluble, contains much oil, and is uncommonly nourishing, but has a strong tendency to putrefaction : hence eggs must be eaten while fresh. People of a weak stomach ought to eat no kind of food easily putrescible, consequently no eggs. To those, on the contrary, who digest well, a fresh egg, boiled soft, (or rather stewed in hot water, from five to ten minutes, without allowing it to boil) is a very light, proper, and, at the same time, nourishing food.

Hard-boiled eggs, fried eggs, pan-cake, and all artificial preparation of eggs, are heavy on the stomach, corrupt our fluids, and are unwholesome. The eggs of ducks and geese ought not to be eaten, but by persons of the most active and powerful stomachs. All eggs

require a sufficient quantity of salt, to promote their solution in the digestive organ ; yet butter renders them still more difficult of digestion : hence it is equally absurd and pernicious to use much butter, with a view to soften hard boiled eggs. We cannot be too circumspect in the use of eggs, as to their freshness ; for there are examples, of persons, after having used corrupted, or only tainted eggs, being seized with putrid fevers.*

* Various modes of preserving eggs have been contrived in domestic life. To prevent the external air from pervading the egg, is the principal requisite. With this intention some smear them with butter, others pack them in bran or common salt ; the farmers in Germany suspend them in fresh river-water, by means of a net ; but all these methods are troublesome and uncertain. The best way of preserving them to any length of time, is to place them in a very strong lime-water, to leave some lime at the bottom of the vessel, and if the water should become turbid, to pour it off and supply it with a fresh infusion. This may be done with boiling water, to dissolve more of the lime ; but it must be allowed to become perfectly cold before the eggs are placed in it.

I shall here take notice of a method lately contrived to preserve animal and vegetable substances, to almost any length of time, without salting or pickling. A Mr. Donaldson has obtained his Majesty's Letters Patent, for inventing a powder, which is said to possess the extraordinary virtues of preserving the flesh of animals, as well as vegetable roots, to an indefinite length of time. If this be true, (though I am much inclined to doubt it) it is easy to conceive how the Egyptian mummies could be preserved for several thousand years. Our East and West India vessels may now save themselves the trouble of taking live stock on board.

In order to afford an opportunity of judging of the merits of Mr. Donaldson's powder, or of giving it a fair trial, I shall briefly state its component parts, as recorded in the Patent—Any quantity of vegetable gum, such as Gum Arabic, or that of cherry-trees, in fine powder, is mixed with an equal quantity of fine flour of wheat or barley : this is made into a paste, and baked in an oven, contrived for that purpose, with a very gentle heat, so as to prevent it from forming a crust. The dry mass is again reduced to a fine powder, and this is the great and astonishing *preservative*.—Either animal or vegetable substances surrounded with this powder, and packed in close boxes in that state, according to the professions of the Patentee, keep fresh, and free from corruption, for almost any length of time.—*Relatu refero.*

Fish, though of a tender flesh, afford upon the whole but a weak nourishment. They are more or less difficult to digest, according to the different kinds of water in which they live. Being of all animal substances the most putrescible, they are much inferior in quality to birds and quadrupeds, on which account they ought not to be eaten by febrile patients and convalescents. Their fat is still more insoluble and indigestible than that of other animals, and readily turns rancid. On account of their indifferent qualities, no satiety is more noxious than that of fish.

Acid sauces and pickles, calculated to resist putrefaction, render fish somewhat better, and more wholesome for the stomach, while butter has a tendency to prevent digestion, and to promote the corruption of their flesh. On the contrary, spice and salt, used in moderate quantities, stimulate the fibres of the stomach to exert their action, and facilitate the digestive process.

Fish dried in the open air, and afterwards boiled soft, are easily digested; but all *salted* sea-fish, as well as smoked fish, are injurious to the stomach, and afford little nutrition. The same remark, though in an inferior degree, applies to fish preserved in vinegar and spice. In general, the heads and tails containing the least fat, are the lightest parts for digestion, as on the contrary the belly is the heaviest. Such as have a tender flesh are sooner digested than those of a hard and tough consistence.

The soft and mucilaginous fishes, like the eel, are partly composed of an oily slime, part-

ly of tough fibres, and are consequently not easily digested. Those living in ponds, ditches, and other standing waters, are certainly less wholesome than river fish, whose exercise is greater, and whose natural element is purer. For standing water easily putrifies, and the fish, lodging in the mire of such reservoirs, continually feed upon the putrid parts. But the same kind of river fish is also of different qualities, according to their different nourishment. Thus, those caught in rivers contiguous to great towns, are less salubrious than others; because they necessarily receive great quantities of the impurities thrown into such rivers.

Salt-water fish are perhaps the best of any, as their flesh is more solid, more agreeable and healthy, less exposed to putrescency, and less viscid. These excellent qualities they possess when fresh; when salted, they have all the properties of salt-flesh, and consequently its disadvantages. With respect to *herrings*, it is certain, that of all the sea-fish they are most easily digested: and salt-herrings, in particular, if eaten in small quantities, dissolve the slime in the stomach, stimulate the appetite, create thirst, and do not readily putrify by long keeping.

Among the *amphibious animals*, the legs of frogs are in some countries esteemed a delicate dish; yet, as they contain a large portion of fat, the stomach cannot easily digest them, without the addition of much salt. The same observation applies to the Turtle, as well as the West-Indian Guana, a species of Lizard, two or three feet long, of a most forbidding ap-

pearance; but its flesh is delicate and salubrious, much resembling that of a chicken.—We also eat lobsters and crabs, which are species of water-insects: as both of them, however, generally arrive at a stage approaching to putrefaction, before they are sold in inland towns, their consumption is attended with considerable danger. Besides, the flesh of lobsters, in particular, is not easily digested, as it possesses a peculiar acrimony, which in swallowing sometimes occasions pain in the throat. Some people, it is said, have been affected with eruptions of the skin, pain in the stomach, and rheumatisms, arising from the use of lobsters. Their jelly, however, is mild and nourishing.*

* The flesh of *river lobsters* is more delicate than that of the *sea-lobster*; but it is at the same time more subject to putrefaction, and ought therefore to be used in a fresh state, with much salt or vinegar. In Germany and other parts of the Continent, lake and river-lobsters are always boiled alive, and generally in milk: a dish much esteemed in families, and of which children are particularly fond.—The Germans cook various species of fresh-water-fish in milk: and although palatable dishes may thus be prepared, yet, on account of the incongruous variety of substances, I cannot approve of the mixture. There is, however, a method of obtaining from lobsters a very excellent and wholesome jelly, the particulars of which I shall here communicate to the reader, upon the authority of a respectable physician at Hamburg. “Take the flesh of about thirty river-lobsters sufficiently boiled; cut it in small pieces, and place it in a capacious earthen vessel, over a gentle fire, with one ounce of fresh butter. After the butter is completely absorbed, add the clean flesh and skin of two calves’ feet, and four quarts of pure soft water. These ingredients must be simmered over a moderate fire, till the whole of the mussels amount to rather more than one quart. In that state, half a drachm of powdered nutmeg, and a handful of chervil, must be added; and after having allowed it to boil up again, the purest part of this mull is to be pressed through a strong linen cloth. When placed, for some hours, in a cellar or some other cool place, it forms a strong jelly, two or three spoonfuls of which will impart uncommon richness and flavour to a basinful of common veal or chicken broth”—I make no doubt that a similar jelly may be prepared of such sea-lobsters, if they can be had alive.

Oysters are eaten both raw, and dressed : when raw, they are in every respect preferable ; for, by cooking, they are deprived of the salt-water which promotes their digestion in the human stomach, as well as of a great proportion of their nourishing jelly. Raw oysters are easily digested, and may be eaten, with great advantage, by the robust, as well as by the weak and consumptive ; as this shell-fish possesses more nutritive animal jelly than almost any other. They farther are generally attended with a laxative effect, if eaten in any quantity : hence they afford an excellent supper to those liable to costiveness.

Snails, though seldom eaten in this country, are equally nourishing and wholesome. On account of their gelatinous nature, they have lately been much used against consumptions ; and as these complaints are now very frequent in Britain, it were to be wished that such patients may give this remedy a fair trial, by boiling a dozen of the red garden-snails every evening in a quart of sweet milk or whey, for half an hour, then straining the liquor through a coarse cloth, and drinking it with sugar every morning gradually upon an empty stomach ; and repeating these draughts for a month or two, if required. This red garden-snail (or the *Helix Pomatia*, L.) has also been used externally in the open hemorrhoids, where fresh snails were applied, every two or three hours, in a raw state, with remarkable success.

Muscles are of a more solid texture, and therefore not so easily digested as oysters. The sea-muscles afford a hard, indigestible,

and, as some imagine, poisonous food. Although the examples of their deleterious nature be very rare, yet they ought not to be eaten without vinegar, or some other vegetable acid, acting as a corrector of their bad qualities, or, in the opinion of others, as an antidote.

Of Vegetable Aliment:

The various articles of nourishment we derive from the Vegetable Kingdom, may with propriety be divided into five orders :

1st, The different species of farina, or grain, such as wheat, rye, barley, and oats.

2d, The legumes, or pulse, such as peas, beans, &c.

3d, The various kinds of salads and pot-herbs.

4th, All the different roots ; and,

5th, Fruit, or the production of trees and shrubs.

The first of these, namely the farinaceous, are very nourishing, on account of the copious mucilage they contain ; but they are likewise difficult to digest. Bread itself, though justly called *the staff of life*, if eaten too freely, or to serve as a meal, produces viscosity or slime, obstructs the intestines, and lays the foundation of habitual costiveness. All dishes prepared of flour, are not only nourishing, but are emollient, attenuating, and correct acrimony. Leavened bread, or such as has acquired an acidulated taste by a slow fermentation of the dough, is cooling and antiseptic ; a circum-

stance well established by experience. By this process of preparing the dough, all the tough parts are most intimately mixed with the drier parts of the flour, and the fixed air is expelled in baking. New-baked bread always contains much of an indigestible paste, which is remedied, either by allowing it to dry for two or three days, or by toasting it. This ought to be done regularly, particularly in times of scarcity, both on account of health and economy. Stale bread, in every respect, deserves the preference: and persons troubled with flatulency, cramp of the stomach, and indigestion, should not upon any account eat new bread, and still less hot rolls and butter. Indeed, all pastry whatever is unwholesome, especially when hot. Those who devour hot pies with avidity, should consider, that they contain an uncommon quantity of air, which distends the stomach, and produces the most alarming and dangerous cholics, and incurable obstructions, insomuch that the stomach and bowels have been known to burst. The porous quality of bread arises from the fixed air having been expelled in baking; and the more spongy the bread, it is the more wholesome. But new-baked bread, and rolls in particular, require a sound stomach; because they contain much mucilage, not having parted with all their moisture; and wheat-flour is more viscid than that of rye, which is the bread-corn of most nations on the Continent.

Bread and butter, together with cheese, as they are eaten in Holland and Germany, form a mass scarcely digestible. The external sur-

face of bread, or the crust, which has been more dried by the heat of the oven, is easiest digested; it contains the empyreumatic part, expelled by fire from the flour; it produces an emollient effect on the bowels; but, at the same time, is more heating and less nourishing than the softer part, or crumb.

The great difference in bread is owing, partly to the different species of grain from which it is made, partly to the time the flour has been kept; for, when new, it is more difficult to deprive it of its tenacity; partly to its being more or less cleaned from the bran; partly to the different methods of fermenting and baking it; to the difference in the water with which the flour has been kneaded; and lastly, to the various ingredients of which the paste has been compounded. The softness of the mill-stones used in grinding the flour, may also vitiate the bread, by introducing particles of sand and marble, so as to make it equally noxious to the teeth, and oppressive to the stomach. Well-baked, and thoroughly dried bread, is easily dissolved by water, without rendering it viscid or gelatinous: hence it is well adapted for the use of the debilitated, as well as for every age or temperament.

Hasty-pudding, on account of its tenacity, and the quantity of mucilage it contains, is not so easily digested as people, who feed their infants upon this dish, are apt to imagine. Porridge made of oatmeal, the common food of children and the lower class of adults in Scotland, is not so heavy as that of wheat-flour; though both of them require vigorous diges-

tive organs, robust constitutions, and strong exercise, in order to produce a proper nutriment.

The *vermicelli*, and *macarone* of the Italians, as well as all the different dishes made of flour mixed up into paste, and either boiled in water or stewed in butter, are ill calculated for patients and convalescents, to whom they are frequently administered. A paste, when it is so elastic that it can be formed into balls, is extremely difficult to be digested. All unfermented pastry is excessively trying to the stomach; and instead of wondering that the lovers of such dainties are continually troubled with indigestion and other stomachic complaints, it would be against the order of things if it were otherwise.

Bread ought not to be eaten with every dish; it is more useful and necessary with those articles that contain much nourishment in a small bulk, in order to give the stomach a proper degree of expansion. Besides, the addition of bread to animal food has another advantage, namely, that of preventing the disgust attending a too copious use of flesh, and its strong tendency to putrefaction. But if we accustom ourselves to eat new baked bread, to provisions already indigestible in themselves, such as fat geese, bacon, blood-sausages, and the like, we make them still more insupportable to our digestive organs. Of the different kinds of grain, from which bread is prepared, that of rye is by far the most wholesome for people of a sedentary life, as well as the delicate and nervous. For though it be

less nourishing, it is likewise less tenacious, and more easily digested, than bread made of wheat.*

Rice contains a thin, unelastic, and easily soluble mucilage. It is one of the popular prejudices, that rice has a tendency to produce costiveness: this is only so far true as the use of it, by persons of languid and debilitated constitutions, is sometimes attended with flatulency, which sufficiently accounts for its secondary effect. To avoid such unpleasant consequences, rice ought to be eaten with the addition of some spice, such as cinnamon, fennel, carraway, annis-seed, and the like; particularly by those of a phlegmatic habit, and slow digestion.—In India, where this plentiful grain is almost the only food of the natives, it is regularly eaten with such quantities of pepper, and other strong spices, that Europeans, on their first arrival, cannot partake of this high-seasoned dish. From a custom so beneficial in its physical effects, we may conclude, that the Indians, though directed more by instinct than scientific induction, are not altogether unacquainted with the rules of diet.

* A few years since, when serious apprehensions of an approaching famine were entertained, in consequence of the scarcity, or rather the high price of flour in this country, the minds of men were sedulously employed in researches tending to avert the impending calamity. Compositions of various substances to serve as substitutes for bread, such as grey-peas, horse-beans, potatoes, and many other farinaceous vegetables, were repeatedly tried. And although a very nourishing and palatable bread was formed of flour mixed with rice and potatoes, yet the prejudices of the lower, as well as the higher classes of the people, in favour of wheaten bread, were too great and inveterate, to admit so useful and beneficial an innovation.

One of the best preparations of rice is the mucilage, or jelly, which is obtained by boiling two ounces of it ground to fine powder, and a quarter of a pound of loaf-sugar in one pint of water, until it becomes a transparent thick broth: this, when expressed through a cloth, and allowed to cool, is a palatable and wholesome jelly.

Oats, when hulled or deprived of the husk, and reduced to groats, are used as the common dish for the infirm and sick in England, France, and Germany. They impart to the water a thick mucilage, which, with the addition of a few currants boiled in it, is of a nourishing and slightly aperient quality.

Barley, or rather pearl-barley, may be used with a similar intention, and is perhaps still more nutritive; but, after decoction, the grosser parts which remain ought not to be eaten.

Millet, or hirse, is inferior to either oats or barley; it possesses too crude a mucilage for relaxed or inactive stomachs.

Manna-grass (the *festuca fluitans*) is so called in Germany and Poland, because its seeds have a remarkably sweet and agreeable taste, particularly before the plant comes to its full growth. It excels in richness and nutriment all the other vegetable productions of Europe; and, boiled in milk, it affords excellent soups as well as puddings. Two ounces of this manna, properly cooked in milk and water, would be a sufficient meal for the most robust and laborious man. Boiled in water alone, in the proportion of one ounce to three pints of water evaporated to one quart, with the

addition of some sugar and white wine, it makes an agreeable and nourishing dish for lying-in women, and other patients for whom animal food is improper, and whose situation requires the occasional stimulus of wine.

The *second* order of vegetable aliment includes all the leguminous productions, as beans, peas, lentils, and the like; these contain a solid gluten or mucilage, and afford a rich and strong nutriment, which best agrees with a vigorous stomach. They also have a considerable proportion of crude particles, which cannot be assimilated to our fluids, and must therefore remain undigested in the bowels, to the great detriment of the alimentary canal. The *meal* of the leguminous class is digested with more difficulty than that of grain; besides, it contains much fixed air; on which account it is extremely flatulent, is apt to produce costiveness, and to communicate various kinds of acrimony to the blood. These effects, however, it produces only when it is eaten too frequently and copiously. Hence bread, made of peas or beans, either alone or mixed and ground together with wheat, is improper for daily use.

Yet we must not imagine, that even the most wholesome articles of food are altogether free from air: this element is a necessary and useful ingredient, to promote the digestion of alimentary substances. The proportion of fixed air varies extremely in different vegetables:—all the leguminous plants particularly

abound with it; and even persons with whom they agree well, must have experienced flatulency and torpor, after a copious use of peas or beans. Those who are fond of peas-soup, would better consult their health, by boiling the peas whole, than split and deprived of their husks; for these promote the grinding of the peas, and prevent them from turning acid in the stomach, which split peas readily do, while they are apt to occasion oppression in the bowels, and a very troublesome heart-burn.

Green peas, as well as *French beans*, boiled in their fresh state, are equally agreeable and wholesome; for they are less flatulent, and more easy of digestion, than in their ripe state. It deserves to be remarked, in general, that all vegetables of the pulse kind, as they advance in growth, become more oppressive to the stomach, and consequently less salutary in their effects.

The *third* order of Vegetables comprises the various kinds of salads and herbs used in cooking, such as greens, cabbage, spinach, and the like. These contain a great proportion of water, and little nourishment: they serve to fill the stomach, resist putrefaction, and may therefore be eaten more freely in summer than in winter; being, besides, of a softening, laxative, saponaceous, and consequently solvent nature, they are well calculated to relieve the bowels. On account of their watery consistence, they are of peculiar service to lean people, to those who lose much

moisture by perspiration, or who are troubled with flushings and undulations of the blood (in which case animal food is improper)—and as these vegetables assist insensible perspiration, they are cooling, and assist all the emunctories of the body. Their nourishment is in proportion to the mucilage contained in them; but as this is in a very diluted state, the aliment they afford is inconsiderable. They are further distinguished by the earthly, acrid, and aërial particles which they contain, both with respect to their nutriment, and their effects upon the first passages. They become soft by boiling, many of the aërial particles are expelled, and they are thus rendered more digestible. But the practice of boiling them in large quantities of water, which is afterwards poured off, is extremely absurd and injudicious; for, with the water, their best and most nutritious parts are consequently thrown away: hence these vegetables ought to be thoroughly washed, and, cabbage excepted, stewed in a small quantity of water, which will so far be reduced by slow boiling, that it may be brought to the table, together with the vegetables. To improve their relish, as well as to render these vegetables less flatulent, we generally add spices, which also assist digestion. And for the same reason, in a raw state, they are eaten with vinegar, salt, pepper, and the like.

Salads, being in general eaten with oil and vinegar, call for all the powers of the stomach, to digest these liquids, together with the raw herbs. *Baked* vegetables with paste and milk,

as they are prepared in some countries, lose all their principal virtues, and readily acquire an empyreumatic oil upon the crust, which is indigestible, and taints the fluids with a dangerous acrimony.

Asparagus is an excellent article of nutriment, although somewhat flatulent and diuretic in its effects. The young shoots of this plant are not only the most palatable, but at the same time the most salutary.—As a good substitute for sparrowgrass, I can from experience recommend the *young buds of hops*, which are more easily procured, scarcely inferior to the former in taste, and, on account of their aromatic quality, very grateful and wholesome.

Artichokes afford a light and tender food, perhaps still more nutritive but less diuretic than asparagus; for this reason, they are preferable for culinary uses.

Spinage, a favourite dish with many, affords no nutriment, passes quickly through the stomach and bowels, almost undigested; and, being usually dressed with butter, it weakens the alimentary canal, produces looseness, and consequently is not proper food for the weak and debilitated.—In languid stomachs, spinage is apt to produce acidity and the heart-burn.

Sorrel possesses an acrid acidity, which deprives the teeth of their enamel, and ought to be avoided by those who are already troubled with an acid taste in the mouth.

Red Cabbage is one of the most indigestible vegetables, particularly as the French and Germans eat it, with ham and chesnuts; it is thus rendered heating, flatulent, and laxative,

and contains no nourishment.—More digestible, cooling, and less hurtful to the bowels, are the young sprigs of cauliflower; but the most indigestible of all is the Colewort (*Caulis rapicius.*) What has been said with respect to cabbage, is applicable also to the Orach, or *Atriplex*, and the Lettuce, when eaten boiled or stewed.

White Cabbage is possessed of excellent properties; it is less flatulent than the common greens, and, being full of water, it is diuretic, and somewhat laxative.—It is remarkable, that all herbs and plants, in general, are more or less flatulent, according to their digestibility, and are disposed to putrescency, in proportion to the time they remain in the alimentary canal.

Of *White Cabbage* sliced or cut in thin shreds, and afterwards seasoned and salted, the Germans make *Sauer Kraut*; which is easily digested, on account of the salt mixed with it, and the acetous fermentation it has undergone, before it is used, and by which the greatest part of its fixed air is expelled. *Sauer Kraut* may be preserved fresh for a long time; it operates powerfully on the first passages, being one of the most excellent antiseptics; it has proved of singular service at sea, in resisting the ravages of the scurvy, and curing it in the most alarming stages. We are indebted to Capt. Cook, for introducing this salutary dish among the sailors, in spite of all prejudices, and thus preserving the health of many brave mariners. Lastly, *Sauer Kraut* has been found the best preventive

against epidemic distempers, particularly against the dysentery, and the putrid and petechial fevers, which it has even frequently cured.

Lettuce contains many nitrous particles, is very cooling, and useful in the evening to those who cannot sleep, from the too great heat and undulations of the blood. But the copious addition of oil and the yolk of eggs renders it less digestible than when eaten in its simple state; but if these must be used it is better to add some sugar, which decomposes these substances. The most suitable ingredients of Salads, besides the *Lettuce*, are the various *Cresses*, *Chervil*, (*Chaerophyllum bulbosum*, Linn.) and the scurvy-grass, which, together with other cooling herbs, produce the effect of cleansing the humours, or, as some say, of purifying the blood, and are at the same time diuretic; especially if eaten in Spring, and upon an empty stomach.

The *fourth* order of Vegetables consists of all the esculent roots, or such as are used at our tables. They are either of the mild, or of the astringent and acrid kind. The former are much more nourishing and less flatulent than the latter, which however possess some medicinal powers, such as the various species of radishes, onions, garlic, and the like.

Roots are neither so nourishing, nor so easily digested as animal food. Yet we may consider it as a certain rule, that any kind of ali-

ment, for which we feel a natural and permanent appetite, is conformable to our nature. Of this kind is that beneficial root, the potato, which, in the most simple preparation, and without any addition, affords an agreeable and wholesome food to almost every person, and particularly to children. It is one of the lightest alimentary substances, occasioning neither viscidty nor flatulence, and can be hurtful only, when immoderately used. But, being a dry vegetable, and containing many earthy particles, it requires a proper quantity of drink to prevent obstructions. Its excellent nourishment is sufficiently obvious in the healthiness of those country people, whose principal food is potatoes, as well as animals that are fattened upon these roots.

The quickness with which the chyle made from potatoes is assimilated to the blood, leaves no doubt that they are easily digested; for it is a general remark, that labouring people sooner feel a renewal of their appetite, after potatoes, than any other species of food. It is a groundless assertion, that they generate a thick and crude chyle, and consequently a gross and viscous blood. It is an equally unfounded supposition, which is amply refuted by experience, that the potato is a narcotic root, and that it is apt to stupify the powers of the mind. This effect is produced only from a too copious use of it, together with want of exercise; in which cases any other food would be attended with similar consequences.

The stimulating powers ascribed to potatoes appear to me merely fanciful. Those of a farinaceous consistence are much more easily digested, than the heavy and gelatinous kind. The flour made of potatoes is more wholesome for pastry, and for all those dishes prepared of meal, than any other. The French have lately contrived a method of preparing a granulated flour from this root, which is grateful to the palate, and very nourishing. It is performed by a machine of simple construction, a representation of which, together with a description, was given, some time ago, in the *Repertory of the Arts and Manufactures*;—and it has also been used successfully, when mixed with wheat flour, in making bread.*

The *Beet-root* contains a large proportion of saccharine matter. By the latest experiments of M. Achard, of Berlin, it has been proved, that about fourteen pounds weight produced one pound of raw sugar, exceedingly sweet, and without the intermixture of any other taste. Independent of this consideration, the beet is a valuable root, both in an economical and culinary respect; it is possessed of mild aperient qualities, and ought to be eaten more frequently, for supper, by those who are of a costive habit. Although it is not difficult of digestion, yet some less flatulent root, such as parsley, celery, or even potatoes, ought to be used together with the beet; which addition

* Whatever has been formerly said against the use of potatoes, it is now well understood that they are wholesome, nourishing, and light to the stomach, even in the weakest constitutions.—M. Permentier, of Paris, lived for several weeks on potatoes only, without experiencing any ill effects on his health.

will render it not only more palatable, but also more suitable to the stomach and bowels.

Carrots are extremely flatulent, and therefore an improper food for the weak, and those inclined to acidity; by such individuals they can scarcely be digested, unless taken with the addition of spice, and a proper quantity of salt; by which means their fermentation and corruption in the stomach will be in a great measure prevented. In other respects, they contain a good and copious alimentary fluid, at the same time powerfully affect the kidneys, and are likewise anthelmintic, or destructive of worms.

Parfnips, besides their sweet mucilage, contain somewhat of the aromatic principle, being more nourishing and less flatulent than carrots. To deprive them entirely of the latter quality, they ought to be boiled in two different waters; but by this precaution they partly lose their sweet taste, and become less nourishing.

Turnips are nutritive, but flatulent, and not easy of digestion; they become still more indigestible with age.—The least flatulent and most nourishing of these roots are the long kind, or Swedish Turnip, lately introduced into this country.

Parsley, as well as *Smallage*, are of a sweet, stimulating, and aromatic nature. The former, especially, was by the older physicians supposed to purify the blood; an effect which modern medical observers would not only doubt, but even ridicule. So much, however, is certain, that parsley is a mild aperient

and diuretic. Yet, for these salutary purposes, it ought not to be eaten in a raw but boiled state.

Celery is one of the most fragrant roots we possess in our climate, though its shoots and leaves are more commonly used for salads, than the root itself. There are two species of celery known among gardeners, both of which are estimable: one produces thick knobby roots, not unlike the size and figure of a short pine apple; the other has a variety of small white, tender, and odorous roots. The latter species is more common in this country, while the former is much esteemed in France and Germany, where it is eaten in thin slices, previously soaked in vinegar; a preparation which, in summer, affords a cooling and wholesome dish. In a raw state, celery is digested with some difficulty, which may be removed by boiling it in water, or soaking it, as before observed, for a short time in vinegar.—The Germans prepare an artificial coffee from this root, by cutting it into small square pieces, which are dried and roasted in the usual manner. Dr. UNZER occasionally recommends this native coffee to his patients, particularly to nurses and lying-in-women, as a wholesome substitute for either tea, or the real coffee of the shops.

The *Skirret-root*, and the *Scorzenera* of Spain, possess more spicy and stimulating than nutritive qualities. Both these roots, as well as the three preceding are diuretic, and consequently in a slight degree stimulating. The *skirret*, in particular, has an agreeably sweet

and spicy flavor, and is so tender, that it can scarcely bear to be boiled. For this reason, it is most properly eaten when raw, like fruit, or may be used as an excellent ingredient in soups and broths.—The *Scorzenera*, on the contrary, ought to be deprived of its black skin, and only eaten boiled: by soaking the raw root for half an hour in cold water, it loses its bitter taste, and is likewise rendered less flatulent.

The *Salsafy*, or Goat's-beard, is a root containing still more of the saccharine principle, than the *scorzenera*: being a good substitute for sparrowgrass, and more easily reared in this climate, it certainly deserves to be more generally cultivated in our gardens.

Onions, *Garlic*, *Shallot*, and *Chives*, are stimulants: they assist digestion, relieve the bowels, expel flatulency, dissolve slime or mucus, and are therefore beneficial in diseases which proceed from too much viscosity; besides, they increase the appetite, and ought to be used principally as spices, or medicines. They are powerful expectorants, but must be avoided by very hot, irritable, and choleric temperaments. Although these roots are eaten in quantities by whole nations, yet from their penetrating and volatile smell, which they communicate to the human breath, it is certain they agree best with individuals of a cold and phlegmatic habit, and those whose stomachs require so powerful a stimulus.

All kinds of *Radishes* may be considered as medicinal roots; they are peculiarly calculat-

ed to dissolve slimy humours, to generate, and also to expel flatulency; moving the air inclosed in the intestines, and expelling it, by the copious air contained in themselves. They are salubrious to strong and active stomachs; but in those which are deficient in elasticity, radishes increase flatulency to the highest and most troublesome degree. The small salad-radishes are more readily digested than the large root; they propel all the alimentary fluids towards the stomach, increase the appetite, and are therefore proper to be eaten before a meal. Old radishes are altogether indigestible, and the whole genus, like onions and garlic, occasion a very offensive breath.

The *Arrow-root powder*, lately imported into this country from the East Indies, appears to afford a larger proportion of nutritive mucilage than any vegetable hitherto discovered: but it is to be regretted that the exorbitant retail-price (eight shillings the pound weight) will preclude many invalids and convalescents from using this excellent root in broths and jellies.

The *fifth* and last order of Vegetable substances comprehends the *Fruit*, or productions, of the different trees and shrubs.

Fruit, in general, possesses strongly resolvent powers, and it is the more beneficial, as it comes to maturity at a time when the body is relaxed by the heat of summer, and when the blood has a strong tendency to inflamma-

tion. It is besides of great service in attenuating the thick bilious impurities collected during the summer, and of evacuating them by its laxative virtues. The acid contained in most kinds is as useful to quench thirst, as to resist putrefaction. In weak stomachs, however, or such as are filled with impurities and slime, it is apt to ferment, and occasion some inconvenience; but this may be avoided by a temperate use, and especially by eating it boiled.

The more sap or juice we meet with in fruit, it will prove the more flatulent; and as the juicy, cooling, and watery species of fruit require strong digestive organs, to prevent them from producing fermentation, flatulency, and diarrhœa, a glass of old wine is very proper to promote their digestion. A gentle diarrhœa, brought on by eating ripe fruit, in summer, has frequently a salutary effect.—Acrid and astringent fruit, being rather a medicine than food, is less hurtful to the healthy, and to children, than is commonly imagined. Instead of being noxious, as some imagine, in inflammatory disorders, it is of the greatest service. Persons of a thick and black blood cannot eat any thing more conducive to health than fruit, as it possesses the property of attenuating and putting such blood in motion; but those of a watery and phlegmatic constitution ought carefully to avoid it.

Fruit preserved with sugar is antiseptic and nourishing, but at the same time flatulent; and if preserved with sugar and spices, it is heating and drying. It is most wholesome when eat-

en on an empty stomach, which can exert all its power to dispel the air disengaged from it, and to remove it, before it begins to ferment. Boiling, as well as drying, corrects the flatulent tendency of fresh fruit, so that, thus prepared, it will agree with every body. By either of these methods it is deprived of its superfluous humidity, as well as of its fixed air; whence it becomes more nourishing, but less cooling, than in the fresh state.

Sago is the medullary part, or marrow, collected from a species of palm-tree growing in the Mulucca and other islands of the East-Indies. This substance, although not strictly the fruit of a tree, well deserves the first place here; for it is used as bread by the natives of India, who macerate it in water, and form it into cakes. The grains of sago, sold in the shops, are obtained by a more artificial process: they furnish a nourishing and agreeable jelly with water, milk, or broth; but require to be previously cleaned of the dust, mould, and seawater. To make a complete solution of sago, the first decoction ought to be strained, and afterwards boiled a second time, for about half an hour. Prepared in this manner, it is a proper dish for the consumptive and convalescent, as well as those whose digestion is weak or impaired.

Cherries produce the effects now stated, in a very pre-eminent degree; they are excellent in scurvy, in putrid fevers, and in dysentery; they correct the blood when inclined to putrescency, and by their saponaceous and melliferous juice, they powerfully resolve obstruc-

tions in the intestines. Those who use them with this intention, may eat them at any time of the day, though they operate most effectually in the morning, on an empty stomach. Even the sweet species contain a stimulating acid, which, in proportion to their juicy consistence, disagrees more or less with the weak and debilitated ; for this sap or juice easily ferments in the stomach, and produces flatulency, diarrhœa, and acidity. On account of these peculiar effects, persons whose stomachs are bilious and vitiated, who are troubled with putrid eructations, and an offensive breath, ought to eat them freely, to counteract that disposition to putridity.

Cherries are divided into the aqueous-sweet, aqueous-acid, and the dry pulpous kinds. The Spanish cherries are the most difficult to digest, but are also the most nourishing. The aqueous-sweet kind, as our early common cherries, are unwholesome ; because their juice easily ferments, and occasions colic and diarrhœa. The watery-acid sort are the best of any ; their juice strengthens the stomach, purifies the blood, and is the least flatulent. Dried cherries are in many diseases an excellent article of diet, on account of their cooling and antiseptic properties. The swallowing of cherry-stones, however, is highly pernicious, as these stones have sometimes been found to accumulate in the intestines, to form lumps cemented together by viscid phlegm, and thus to produce the most violent and fatal symptoms.

Plums also possess medicinal virtues ; they are nourishing and attenuating. Prunes, or dried plums, are of peculiar service to costive habits, affording an agreeable and nutritive dish ; but, as they are apt to produce flatulency, it would be adviseable to eat them either when the stomach is empty, or for supper, without mixing them with other aliment. Under this limitation, they are both aperient and cooling, and agree with almost every constitution ; but plums eaten fresh, and not quite ripe, especially in large quantities, are very apt to occasion looseness, colics, and other maladies of the stomach and intestines. The larger sort of plums are in general more dangerous, in this respect, than the small ones, as they (particularly the green and yellow kind) are seldom allowed to grow perfectly ripe.

Tamarinds are more frequently employed for medicinal purposes, than as an article of diet. The pulp of this fruit is one of the most grateful acids ; which, if taken in the quantity of from half an ounce to an ounce or more, proves gently purgative. By its acidity, it is well calculated to quench thirst and allay immoderate heat.

Peaches abound with juice, and though not very nourishing, they are not productive of diarrhoea. This salutary fruit was formerly decried as unwholesome ; but it is rather serviceable in obstructions and bilious disorders. Sugar, wine, and the like, diminish the good qualities of peaches ; and even when preserved in brandy, they are not so wholesome as when fresh ; since they become hard by all ar-

tificial preparations. The kernels likewise of peaches are a wholesome bitter, and are cleansing, on account of their astringent properties.

As there are various kinds of peaches, of an inferior quality, it will be useful to point out the distinguishing marks of that fruit, in a mature state. The best sort of peaches have a delicate thin skin, which is easily separated from the pulposus part. Those which are not naturally smooth ought to be covered with only a small quantity of down; for too much down or wool on the surface is a sign of their inferior quality. They are likewise not to be depended upon as being wholesome, if they are of a size either too small or preternaturally large. Their pulp ought to be delicate, yet solid, somewhat fibrous, and full of juice; it should not adhere to the stone or kernel, and readily melt in the mouth.

Apricots are more pulpy than peaches, but perhaps less nutritive: their juice readily ferments and turns acid in weak stomachs; yet, when ripe, and used with moderation, they are cooling and antiseptic, particularly for bilious and plethoric individuals.

Of *Pears*, some are extremely hard, astringent, and difficult of digestion; but the more juicy pears have a saponaceous, nourishing, and readily digestible fluid; in their effects they resemble the sweet kind of apples, except that they are less relaxing to the bowels. Pears are of a more flatulent tendency than any of the fruits before mentioned, and especially the hard winter-pears, which are eaten

at a time when the stomach requires stimulating more than cooling food.

Apples are, in their general effect, similar to other fruit, and, besides their aromatic virtues, are possessed of laxative properties. They are serviceable in diseases of the breast, to remove spasmodic contractions, to neutralize acrimony, and to attenuate viscid phlegm. With this intention, apples are most beneficial when eaten either roasted or boiled. The common people in Germany are so sensible of their excellent properties, in inflammatory diseases, that they boil even the wild apples, and drink the water. This process deserves imitation, especially when apples become scarce in Spring.

Apples may be divided into the spicy, the acidulated, and the watery species. The first, the various kinds of rennet, for example, have the most delicate flavor, and are certainly the best; they do not contain a superfluity of water, and, from their vinous nature, are not apt to excite flatulency. Other kinds of apples, like the pippins, are too hard, consequently heavy to the stomach, though somewhat more nourishing than the former. Stewed apples are easily digested and wholesome.

The kernels or seeds of apples are bitter and aromatic; Nature seems to have intended the seeds for correcting the watery and fermentable fluids of this and all other fruit, apricots excepted. Hence the kernels of apples and pears, as well as those of plums and cherries, ought to be eaten with the fruit, and not be thrown away as useless.—The but-

ter in the paste of apple-pies may be considered as an useful addition, on account of its tendency to prevent fermentation, though the pastry itself always disagrees with weak and irritable stomachs.

Of *Quinces* we have two species, namely, the apple and pear-quince : the latter are the most wholesome, particularly those of Portugal. They are an excellent antiseptic, and in this respect the best kind of fruit, containing an acid and much mucilage. They are not productive of obstructions ; but their pulp, like that of all other fruit, is digested with some difficulty. They are generally eaten boiled with sugar, and are excellent in dysentery, on account of their copious mucilage.

In *Lemons, Oranges*, and other fruit of that kind, we meet with three different substances. The external rind contains an essential oil, strongly astringent and heating ; the second or white rind is without taste ; the third part of them is a salubrious, cooling, and acid pulp, highly efficacious in counteracting the putrid tendency and dissolution of the blood. The juice of lemons and limes is one of the strongest vegetable acids ;* and that of oran-

* If the objections started against the use of these acids, by a late physician in Germany, Dr. UNZER, be well founded, we ought to guard against their use. He maintains that, although lemons and limes may be wholesome and refreshing fruits in their native country, yet as they are packed up and sent to us in an unripe state, they possess an acrid and unnatural acid, from not having undergone the vinous and acetous fermentations, and which consequently cannot be wholesome. The juice, especially, which is obtained from the middle of those fruits, having acquired an highly astringent though not unpleasant taste, from the

ges and shaddocks, though milder, is not less salutary.

These acids are of a very saponaceous consistence; they attenuate the fluids, remove obstructions, encourage digestion, stimulate the appetite, quench thirst, cool the blood, counteract putrefaction, are a principal remedy in pectoral, bilious, and inflammatory diseases, as likewise in scurvy, in all affections of the kidneys, and an antidote against the narcotic vegetable poisons. Hence the largest dose of opium may be checked in its narcotic effects, if a proper quantity of the acid of lemons be taken with, or immediately after it. Four grains of pure opium, for instance, or one hundred drops of laudanum, is a very powerful and sometimes fatal dose; yet if one ounce of the pure acid of lemons, or two ounces of orange juice, be added to every grain of opium, or to twenty-five drops of laudanum, it will produce a very different effect. Instead of stupifying the person who takes it, and of being attended with painful costiveness, it will not only prove laxative, but induce first a cheerfulness, not attainable by the use either of opium or strong liquors, and afterwards bring on a gentle and refreshing sleep.

Astypic quality of the bitter kernels, is extremely unwholesome. It is, according to the observations of Dr. Unzer, very apt to impair digestion, and to occasion either diarrhoea or constipation of the bowels.—Such effects, however, will be produced only when these acids are *immoderately* used; in which case the most wholesome substances will be attended with bad consequences, and ever form exceptions from the general rule. Yet I must agree with Dr. U. that the peel of lemons and oranges contains an inflammable and heating oil, which, if rubbed on sugar, for making punch, lemonade, &c. is apt to produce dangerous effects.

Of these effects I can speak from my own experience, as well as that of others. Opium, used with this addition, is one of the most salutary and beneficial substances with which we are acquainted. I am farther inclined to believe, that the Turks, who eat very little animal food, could not bear the large quantities of opium they swallow, were it not for the copious use of vegetable acids. And that these form a principal part of a Turkish summer diet, every traveller knows, who has visited the eastern climates.

For these reasons, I cannot sufficiently recommend the use of acids to persons, who are either accustomed, or obliged, to take opiates in large doses. In choleric, bilious, and plethoric habits, in those liable to obstructions, whose alimentary canal is unclean, and lastly, in those who feel a determination of the blood to the head, opium is an uncertain, and even dangerous medicine, without the addition of vegetable acids. The want of the acid of lemons may be effectually supplied by an indigenous production:—barberries afford an acid fully as strong, and nearly as agreeable, as that of lemons.

The juice of the various species of *Raisins* is not unlike that of *ripe* lemons in its properties, but less efficacious. There are various kinds of that excellent fruit. Among the larger sort, those of a blueish colour, imported from Marseilles, are the best; while the Spanish raisins, of a light brown colour, are inferior to those of any other species. Both kinds, as well as *Currants*, contain much nutriment,

but cannot be recommended for frequent use, as they all tend to produce flatulency, particularly in individuals of relaxed habits and a sedentary life. On this account, they ought to be eaten with other food, in which case they are emollient, gently laxative, and sometimes anodyne.

Gooseberries, having less of the acid than either raisins or currants, are perhaps more wholesome, especially if their skin and other impurities are not swallowed together with the juice. When used in a green state, for sauces and pies, they are cooling and refreshing; and, when ripe, possess similar properties with cherries.

Figs abound with saccharinè matter, and are uncommonly nutritive, though at the same time of a flatulent nature, unless eaten with bread or other mealy substances.—Of similar effects are mulberries and raspberries: the former have a more mucilaginous and nourishing juice, while that of the latter is more of a vinous nature, and one of the best cordials for allaying thirst and affording refreshment.

Grapes and *Strawberries* are both excellent fruits. They are uncommonly resolvent, laxative without debilitating, and promote all the natural evacuations; but at the same time, grapes are in a high degree flatulent.

The quality of grapes depends much on climate and soil. Those of a sweet taste, and aromatic flavour, only ought to be used. They agree best when eaten on an empty stomach, with a small quantity of bread. Besides their slightly nourishing quality, it is affirmed by

Some writers, that they cool the blood and animate the nerves.

Strawberries, if eaten plentifully, have been found a safe preventive against the stone in the kidneys; as is attested by the experience of the celebrated LINNÆUS. Yet the small stones contained in strawberries, as well as in grapes, are said to accumulate in the intestines of some individuals, and to give rise to the most obstinate constipations, nay even to the iliac passion. The best method of eating strawberries is with pure water, and sweetened with a little sugar; they are more heating with wine, but less wholesome; with milk or cream they are an agreeable but improper composition. As a medicine, the wild strawberry is far preferable to any other.

Cucumbers are a wholesome, gently opening, and cooling fruit, which may be of considerable service to the consumptive, as it has the property of sweetening acrid humours. They show a tendency to ferment, and produce diarrhœa; but this may be prevented by the addition of vinegar and pepper, which also counteracts their natural coldness. Prepared with oil, vinegar, salt, and pepper, they are insupportable to some weak stomachs, and occasion frequent eructations and flatulency. But properly pickled, they are an excellent antiseptic, though unfit to be given to children and wet-nurses.

Much of the same nature with cucumbers are *Melons*; but they are more aromatic, and, in this respect, more wholesome. *Water-melons* require more spice and wine than *Muskmelons*;

as they partake more of the nature of Cucumbers.

Gourds, a fruit of the melon-kind, but less sweet, and of a much larger size, if boiled in milk, after the first water has been poured off, and with the addition of salt and pepper, affords sufficiently wholesome and nutritive food.

Olives, in their natural state, are bitter, acrid, and exceedingly disagreeable; though their taste is much improved when pickled, as we receive them from abroad, particularly in the smaller kind, or Lucca olives. On account of the abundance of oil which they contain, they are unfit for delicate stomachs, and are pernicious, especially when eaten for desert, after a heavy dinner.

Almonds, Walnuts, Hazlenuts, and Nuts in general, are extremely difficult of digestion, on account of the oil they contain, which readily turns acrid and rancid on the stomach, and occasions the heart-burn. Bilious individuals should by no means eat them; and there is nothing so absurd as to administer *almond-milk* as a common diet drink to febrile patients. This milk consists altogether of oily and almost insoluble parts, which heat and vitiate the stomach, stimulate the bile, and are easily decomposed from the water with which they are mixed. It quickly spoils; frequently, indeed, before it is introduced into the stomach: it is not in the least degree cooling, and its nourishing quality is very improperly employed in fevers, and all those diseases which are attended with debility of the alimentary canal.

Nuts and almonds ought to be eaten only while fresh, and when the skin, which is extremely astringent and hurtful, can be removed. They should be well chewed, and eaten with salt; for every piece swallowed entire is indigestible, and the salt renders them miscible with our fluids as a saponaceous mass. If eaten in large quantities, they remain in the stomach, cannot be expelled by any medicines, and produce alarming and sometimes fatal disorders. In general, they occasion difficult breathing, vomiting, and complaints in the bowels, which have been observed to be very common in those autumns that were productive of great quantities of nuts.

Last among the vegetable productions, we may class the various species of *Mushrooms*. They are all of a tough, leathery consistence; and being almost indigestible, they afford little nutriment, notwithstanding they, in a great measure, resemble animal food.

Several kinds of mushrooms are said to contain a narcotic and acrimonious poison. And as those of a harmless kind cannot be easily distinguished from the bad ones, this might be a sufficient reason to abstain from the use of them altogether. But if they must appear at our tables, vegetable acids, or vinegar, are the best antidotes, to counteract their pernicious effects. Pickled with vinegar, or salted, mushrooms become still more tough; and roasted with butter, they are an indigestible mass, and extremely liable to turn rancid in the stomach.

*Of Drink in particular.**I. With respect to its Quantity.*

Drinking is perhaps more necessary to the support of animal life than *Eating*; for drink is indispensable to the solution and digestion of food. Those who drink too little, people, for instance, of a sedentary life, and particularly women, are subject to complaints of indigestion. Sufficient drink prevents the incrustation of the blood, and the obstruction of the smaller vessels; it tends to clear the blood of the acrid particles generated in it; and it promotes the necessary secretions, such as the bile and the gastric juice of the stomach.

We ought to drink only when we are thirsty, and to desist when thirst is quenched: but this is seldom the case, because many of our liquors stimulate the palate. Pure water, therefore, is an inestimable beverage, as it will not induce us to drink more than is necessary. We should drink in a greater proportion than we eat; for the quantity of our fluids by far exceeds that of the solids, and consequently there must be secreted more fluids than solids. The general rule may be given, to take about double the proportion of liquid to the dry food; but this cannot be accurately observed, nor is it applicable in all cases.

The season, the weather, cold, heat, the nature of our food, and the greater or less degree of our exercise, require more or less drink at one time than at another. Thirst, however,

is as good, if not a better guide than hunger ; and he who is accustomed to drink water only, will not easily transgress the measure, if he drink as often as nature calls upon him. With a proper choice of food, every one would drink conformably to his wants. Hence it is needless to recommend water as a beverage to persons who will not be persuaded to change their irregular mode of eating.

The more we eat in quantity, and the drier our victuals are, the more we ought to drink. The phlegmatic have less inclination to drink than those of a sanguine and choleric temperament. The laborious ought to drink more than the sedentary, and still more in summer than in winter, to supply the humours lost by insensible perspiration.

In the morning when we rise, we generally feel an inclination for drink, which is relieved by tea, coffee, or other warm liquors. Water would unquestionably be a more proper beverage at this time ; and I venture to say, it would be disagreeable to those only, whose stomachs are spoiled by the habitual use of warm liquors and hot rolls. A glass of pure fresh water, and a while after it, a piece of bread with some fruit, or even butter, would afford a very wholesome breakfast, by which the stomach and the intestines might be cleared, the blood and humours refreshed, and the whole body strengthened. If the stomach be not loaded with mucus, or relaxed by tippling, a basin of sweet cow's milk, with a piece of stale bread, is an excellent breakfast in Spring and Summer.

To drink immediately before a meal, is improper, because the stomach is thereby swelled, and rendered less fit for the digestion of food. Hence, to avoid the necessity of drinking, it is advisable, not to take any violent exercise immediately before dinner. To drink much at night, previous to our going to bed, is likewise hurtful. But the drinking before a meal is more noxious than at any other time; because the stomach is filled with the liquid we swallow; the bile and the gastric juice there collected are too much diluted; and consequently the important office of digestion is checked.

To drink much during the time of taking food is also objectionable; as the stomach is thus rendered incapable of receiving the due portion of aliment. Cold beer or water does not well agree with warm victuals; and the teeth are injured by taking hot and cold substances in immediate succession. In the hot weather of Summer, it is scarcely possible to delay drinking till the dinner be finished; and it is the more necessary, or rather less hurtful, at this time, as the bile which serves to dissolve the victuals, then, requires greater dilution. In Winter, unless we eat very dry and salted provisions, we feel less inclined to drink at table. But if we must drink in the intervals of eating, it would be most conducive to digestion to drink water only, and in small quantities: as pure water is more proper during the time of eating, because it agrees with all dishes without exception. Yet a glass or two of wine, during dinner, particularly for the aged.

and debilitated, is proper and conducive to digestion.

Some advise us never to drink without eating something; but he who drinks only when nature requires it, has no occasion to eat every time he drinks. Persons, on the contrary, who are once accustomed to drink more than is necessary, or to make use of hot, stimulating, and intoxicating liquors, would do well to eat always some bread or other solid food along with them. Indeed we ought to begin to drink only after our appetite for food is satisfied, and then it should be done gradually during digestion. This function may be disturbed by large draughts of liquor, which occasion fermentation and flatulency.—Glas is the most proper substance for drinking-vessels; for no other but the fluoric acid will affect it.—For the sake of delicacy, as well as health, every person at table ought to be furnished with a separate glass or other vessel for his drink.

Much drink loads and oppresses the stomach, as it distends it too much; but it is not nearly so hurtful as too much food. Every beverage relaxes the stomach; and persons whose bowels are not sufficiently elastic, should be careful in the quantity they drink; for an immoderate proportion of it may weaken digestion, dilute the fluids too much, and conduct the food too quickly through the alimentary canal. An undue portion of drink renders the mass of the blood too thin and watery; from a thin blood arises also a weak alimentary fluid, consequently a general debility of the body, and relaxation of the urinary and other passages.

On the other hand, too little drink is equally improper; digestion is weakened; many parts of victuals remain undissolved, and are not conducted to the lacteals, because the proper means of diluting them are wanting; the blood becomes thick and viscid; and finally, the secretions and excretions are not duly performed, because the different canals are too dry and contracted.

II. *With respect to its Quality.*

THERE is as great a diversity among the kinds of beverage, as there is among those of food: water itself is of very different qualities, according to the particles with which it is impregnated, and the places from which it is obtained. That of wells, springs, rivers, lakes, swamps, and the various mineral waters, all differ in their sensible properties. Even cold and warm water produce different effects. The former, when moderately used, strengthens the stomach, and proves debilitating only when it is drunk in too large quantities. Warm water is always relaxing, and still more so when taken in a large quantity; it remains longer in the stomach than cold water, and consequently is more oppressive: cold liquor stimulates the stomach, but warm drink diminishes its elasticity.

If the stomach be overfilled with drink, and its elasticity weakened, a glass of strong wine, or other spirituous liquor, may remedy this inconvenience.—Water can only so far be called nourishing, as it supplies the aqueous parts we continually lose. It is the basis of

all other liquids, and the greater proportion of water they contain, the more fit they are to promote digestion.

Spring-water originates partly from that of the sea, which has been changed into vapours by subterraneous heat, and partly from the atmosphere. As it is dissolved, purified, and filtered in a variety of ways, before it becomes visible to us, it is lighter and purer than other waters.

Well-water is more or less pure, according as it passes over beds of earth, which contain soluble, or minute particles. Wells opened in a sandy soil are the purest, because the water is there most completely filtered. The more frequently a well is used, the better its water, provided that no impure substances are introduced into it; for, the longer water stands unmoved, it turns the sooner putrid. Well-water, finally, may be most effectually purified by filtering it through a quantity of sand and small pebbles; and still more conveniently by means of filtering-stones.*

River-water is more pure and wholesome, if it flows over a sandy and stony soil, than if it pass over muddy beds, or through towns, villages, and forests, from which it receives many impure substances: the water is rendered foul by fishes, amphibious animals, and plants. Lastly, the more rapid the course of the river, the easier it clears itself of feculent particles, and the water becomes purer.

* The filtering machines lately invented by Mr. Joseph Collier, of London, promise to be very useful for domestic purposes, as they are applicable to all fluids, but more particularly water.

Lake-water much resembles that of rivers in its properties, but being less agitated, it is more impure, and better adapted to washing than cooking.

The water, which in cases of necessity is obtained from *swamps* or *ditches*, is the worst of all ; because a great variety of impurities are collected in it, which in a stagnant water and a soft soil readily putrify. And, as the mere exhalations of such waters produce a pestilential atmosphere, it may be easily conceived, that the use of them must be attended with putrid and other dangerous diseases.

Rain-water is also impure, as it contains many saline and oily particles, soon putrifies, and principally consists of the joint exhalations of animals, vegetables, and minerals, of an immense number and variety of small insects and their eggs, seeds of plants, and the like.—*Rain-water* is particularly impure in places filled with many noxious vapours, such as marshy countries, and large manufacturing towns, where the fumes of metallic and other substances are mixed with rain. In high and elevated situations, at a distance from impure exhalations, if no strong winds blow, and after a gentle shower, rain-water is then purest ; because the vapours of the atmosphere have already subsided. In Summer, however, on account of the copious exhalations, rain-water is most objectionable.

Snow-water possesses the same properties as rain-water, but it is purer : both are soft, that is, without so many mineral and earthy particles as spring, well, and river waters. Still

purser is *hail-water*, as being produced in the higher regions of the atmosphere, and having a form, in which it cannot easily partake of impurities. Lastly, *Dew*, as it arises from the evaporations of various bodies of the vegetable and animal kingdoms, is more or less impure, according to the different regions and seasons.

As the health of man principally depends on the purity and salubrity of the water he uses, we ought, where necessary, to deprive it of its pernicious qualities; and this can be done by boiling, filtering, and most effectually by distillation. The putrid substances in the water may be corrected by the addition of an acid. Thus, half an ounce of alum in powder, will make twelve gallons of corrupted water pure and transparent in two hours, without imparting a sensible degree of astringency. By the addition of a very small quantity of quick lime, water may be preserved from corruption in long voyages: or, to prevent water from putrescence at sea, add a small quantity of alkali and vitriolic acid to every cask, which will preserve it pure and wholesome for a twelvemonth. Charcoal-powder has also been found to be excellently adapted to check the putrid tendency of water, and for this reason the staves of the casks, used on shipboard, ought to be well burnt in the inside, to keep the water from corrupting. Vinegar, or other strong acids, are also well calculated to correct putrid water; and may be either mixed with it, or drunk immediately after, to prevent its bad effects.

Wine, that salutiferous liquor to the infirm and the aged, may be divided into *five* principal classes :

1st, The *sweet wines*, for instance, those of Hungary, Spain, Italy, Greece ; the Malaga, Malmsey, Madeira, and Cape wines. If these be genuine ; if they have not been adulterated by the addition of sugar or honey, &c. if they have been properly fermented, they afford a true medicine to the weak and convalescent.

2d, The *weakly acidulated wines* ; such as old Rhenish, Champaign, those of the Mosel. of the Neckar, Franconia, and Austria ; of these the Rhenish, Mosel, and Champaign wines are the best.

3d, The *acid and tart wines* ; among which are most of the wines of Franconia, Thuringia, Saxony, Silesia, and some parts of Brandenburg. These wines, in general, are apt to occasion head-achs, complaints of the stomach, and are besides of an unpleasant taste.

4th, The *acidulated sweet wines*, particularly those of France, as the common white wine and claret, are wholesome, provided that they be neither too old nor too new ; and

5th, The *sharp and astringent wines*, such as Port wine, Burgundy, the dry or hard kinds of Madeira, Sherry, and the like, which, on account of their heating and binding nature, ought to be used chiefly for medicinal purposes.

There are a great variety of fruit-wines, which are fermented like wines from the grape ; for instance, the currant and raisin-

wines: but the artificial wines of this country are, in general, liable to many strong objections. Among our home-made wines may be reckoned Cyder and Perry, which are properly wines of Apples and Pears. Cyder and Perry are, it is said, generally fermented and kept in leaden vessels, or at least the Apples and Pears are passed through leaden tubes; and the lead being readily dissolved by the acid, is gradually introduced into the body, which produces painful and dangerous colics, and frequently gives rise to the most desperate and incurable obstipations, among those habituated to the free use of these liquors.

With respect to the constituent parts of wine, I shall only remark, that every kind consists of three principal ingredients, *water*, *alcohol*, or a pure spirit, and *sugar*. If these three substances could be so intimately combined as they are in wines, and if afterwards the proper aromatics were added, to impart to them the particular flavour, there is no doubt, but we could perfectly imitate every wine whatever. But the greatest obstacle to this speculation is the length of time, which wines require to arrive at a proper state of maturity, and which, in made wines, ought to be still further prolonged.

The more water the wine contains, it is the more suitable beverage at table, and, when weak, it is in some degree calculated to quench thirst. The strong wines, on the contrary, excite thirst, as they are drying, and affect the organs of secretion. As every kind of wine contains a greater or less quantity of acid, it

is an excellent antiseptic remedy, and hence it is given copiously in putrid ulcers and malignant fevers. Moderately used, it increases the circulation of the fluids, and dilates the blood-vessels, promotes both the secretions and excretions, and invigorates all the functions of the body. Every motion is performed with greater vivacity, as is obvious from the additional lustre of the eyes. But the strength and vigour which wine imparts to the body, is of no longer duration, than while it remains in the stomach, before it enters into the mass of the blood, and while the stimulus received by the nerves of the stomach, is propagated to the brain. This explains the cause, that strong liquors are so intoxicating, when drunk upon an empty stomach.

That wine operates on and through the stomach, is clear from experience; for an emetic taken immediately after it, will soon make a drunken man sober. But if its spirituous parts be communicated to the blood, so as to occasion fluctuations, the body becomes disordered, weak, and relaxed. It is only a stimulant, and not a permanently strengthening cordial; for most wine-drinkers, who indulge in excess, die of relaxation and debility. There may, however, be cases in which an occasional excess of this kind will be salutary; for instance, to a person who has been long sitting at study, or whose mind is depressed, and whose fluids are nearly stagnating: as passions sometimes conduce to animate the mind, and tempests to purify the atmosphere.

The *state of intoxication* is in every respect similar to that of incipient apoplexy or palsy.—Drunken men stagger in various directions, their tongue loses its power of speech; they stammer, and see things double and moving circularly. The mind is equally affected, and imbecility is the concomitant effect. All these partial palsies arise from the pressure of the blood-vessels on the brain, which are then surcharged with blood. If the intoxication has arrived at its utmost height, there is no longer any difference between this and the true apoplexy; all the other organs are paralysed, except the heart, which continues its action, and breathing is not suppressed. The imprudent sufferer is deprived of sensation, and if one of the smaller blood-vessels, that press on the brain with an unusual weight, should accidentally burst, he is in danger of instant death. But still more frequently does one of the pulmonary vessels burst, and occasion spitting of blood.

In drinking, also much depends on the bodily constitution and other circumstances.—Thus, people are soonest intoxicated in a cold place, where perspiration is checked, and when the blood is moving from the external to the internal parts. The same is the case on an empty stomach, but this may be prevented by eating a little at intervals, especially fat or oily substances. Individuals of much sensibility and irritability, and persons after having taken violent exercise, are more liable to intoxication, than those of a calm and a phlegmatic temperament.

For these reasons, a person much inebriated ought to be carried without delay into a temperate room, and placed in a bed between the blankets, with his head raised, in order to promote the circulation of the blood, from the head and the internal organs towards the surface of the body and the lower extremities. All close bandages of the shirt and garters must be loosed, and the feet should be bathed in lukewarm water, not exceeding the ninety-eighth degree of Fahrenheit. Plenty of tea or other diluent drink ought to be given, and a gentle emetic is frequently of great service.

After a good sleep, which has overcome the intoxication, the whole body feels weak and tremulous; and the stomach disordered. In this state, persons are generally troubled with much acid in the digestive organ, which may be removed by the absorbent earths, such as magnesia; after which, some sedative and strengthening remedies may be given, such as hot red-wine negus, warm ale with ginger, strong coffee, and the like.

The copious use of wine, though not to a degree of inebriation, is exceedingly debilitating to the stomach, checking digestion, exciting diarrhœa, if white-wine, and obstructions, if port-wine be the favorite liquor; it makes the fibres dry and rigid; the cheeks and the whole surface of the body turn fallow, a symptom of bad digestion; the powers of the body and mind are enfeebled, and dropsy or gout, and sometimes sudden death, are the consequences. Plethoric young men, and such as have weak stomachs and lungs, should not ac-

custom themselves to the use of wine. To give it to infants or children, is a practice highly pernicious, except in very small quantities indeed. In short, wine should be used as a medicine only, if intended to produce salutary effects. To the phlegmatic, to the aged, and to those who are disposed to flatulency, and after fat meat, it is highly beneficial, if used with prudence and moderation.

As wine encourages perspiration, it dries the body, makes it lean, and may therefore be of service to cold and phlegmatic constitutions. It stimulates the bile, and excites the appetite to a repetition of excess, so that persons once habituated to drinking can but gradually relinquish this seductive practice. To drink wine copiously every day, is as improper and pernicious as to take medicines by way of diet : nothing is so much calculated to occasion habitual indigestion. And as wines are frequently adulterated with sugar of lead, and other poisonous ingredients, to render them more agreeable to the palate, I propose to bestow some attention on this important subject, in order to enable the reader to detect such pernicious mixtures, which may expose his health, and even life itself to the greatest danger.

Some of the adulterations of wine are rather harmless, others extremely dangerous. The common red-wines are frequently made of new, tart, and half-spoiled white wines, by tinging them with red fumach, or other woods and berries. In order to make wines stronger and more pungent, a variety of spices are employed, such as galangal, cardamom, mace, and

the like; or an unfermented must, wort, or the mash for distilling spirits, are occasionally added, and allowed to ferment together with impure wines. To impart to wine the flavor of muscadel, the leaves of the *Horminum*, a species of Sage (*Salvia Horminum*, L.) are often used; though it be a plant of a strong stupifying smell, and very pernicious effects.

All adulterated wines, and what we call British wines, if drunk in any quantity, are more or less detrimental to health. For, even by the most innocent mode of preparing them in large quantities, the manufacturers are induced to season them with spices of a heating and stimulating nature. But the most deleterious of all adulterations of wine, is that with the various preparations of lead, to give it a sweet taste. This infamous practice was carried on, some years ago, in Paris, to such an extent, that the Excise-office could not account for the prodigious increase of Vinegar entered at the city-gates. But it was at length discovered, that this vinegar consisted only of tart and adulterated wines, imported under the pretended character of vinegar, in order to avoid the high duty imposed upon wines, on their entrance into Paris: and sugar of lead, joined to some absorbent earths, was employed to change these vinegars into sweet wines, which destroyed the lives of many thousand persons. This secret of the utmost importance to health and life, was confessed by a rich old wine-merchant, on his death-bed, to relieve in some degree his tortured conscience.

Such adulterated wines operate like slow poisons ; they first occasion head-ach, contraction of the throat, pain of the stomach, uneasiness, cough, difficulty of breathing ; afterwards colics, and particularly the dry belly-ach, with continual obstructions, and at length palsy, convulsions, consumption, and death.—The brass cocks also, which are by some people used to draw off wine or cyder, are of the most dangerous tendency ; as they easily yield and mix their verdigrise with the liquor.

To detect adulterated wines, we must attend to the following particulars : every white or straw-coloured wine of a sweetish taste, afterwards astringent, and at the same time new ; every wine that has an unusually high colour, not in proportion to its strength and age, or if it has the flavour of brandy, penetrates the tongue, or lastly, if it has an uncommonly strong flavour, may be justly suspected of adulteration.—Red wines, either of a very deep or a very faint colour ; of a woody or tart taste ; and those which cover the inner surface of the glass, as well as the bottom of the bottles, with a red sediment, are generally tinged with some colouring substances. If such a wine be passed through filtering paper, the colouring particles will remain behind on the paper.

By the following method, we may easily discover, whether wines be adulterated, or coloured, with burnt sugar, raisins, whortle-berries, and the like. A small phial must be filled with the suspected wine ; the opening is

stopped with the finger, and the phial, being inverted, is plunged into a tumbler of water : the finger being withdrawn from the mouth of the phial, if the wine be adulterated the substance with which this is done, will visibly escape from the phial, and mix with the water ; in so far at least, as the addition is heavier than water, which is generally the case.

These adulterations, however, are of little detriment to health, if they contain no *metallic* particles. In order to discover these, we are possessed of an excellent chemical test, contrived by Prof. HAHNEMANN, in Germany, and known by the name of *Liquor vini probatorius*. It is prepared as follows : One drachm of the dry liver of sulphur, and two drachms of cream of tartar, are shaken in two ounces of distilled water, till it be completely saturated with hepatic air : the liquor is then filtered through blotting paper, and kept in a close stopped phial. From sixteen to twenty drops of this liquid are dropped into a small glass, filled with wine that is suspected to have been adulterated. If the wine turn only thick with white clouds, and deposit no other but a white sediment, we may be certain that it contains no metallic ingredients whatever ; but if it turn black, or even dark, if its colour approach that of a dark red, if it have first a sweet, and then an astringent taste, it is certainly impregnated with sugar of lead, or some other preparation of that metal equally destructive. If, however, the dark colour be of a bluish cast, not unlike that of pale ink, we may suspect the wine to contain iron in its

composition. Lastly, if the wine be impregnated with copper or verdigrise, it will deposit a sediment of a blackish grey colour. This experiment ought to be made with a fresh-prepared test, and in the open air.

It further merits attention, that white wines are very frequently coloured with burnt sugar and other vegetable bodies ; they acquire a darker colour by being kept in oak casks, or by containing much tartar ; and in all these cases they will be made somewhat darker by the above described test ; but the sediment will not be of an uniform colour, and will consist only of some brown streaks.—It is well known, that all white wines must be impregnated with a small quantity of sulphur, in order to preserve them : if this be done in moderation, it is not detrimental to health ; but if too great a proportion of sulphur be used, such wine occasions great heat and thirst, it soon intoxicates, produces eruptions of the skin and face, head-ach, trembling of the limbs, and palpitation of the heart, hemorrhoidal complaints, gout, and a variety of nervous symptoms. Nothing is so easily discovered as sulphur ; for by putting a piece of silver, or even the shell of an egg, into an over-sulpherated wine, it will instantly turn black.

Wines are sometimes adulterated by mixing quick-lime with them, in order to produce a beautiful ruby-colour. If such a wine be poured into a tumbler, and allowed to stand for a day or two, a thin crust or pellicle will be formed on the top, by which the lime held in solution will be detected. It is affirmed

that such wines, if used for any length of time, bring on gouty and gravelly complaints.

The most innocent adulteration of wine, and perhaps the most frequent, is that with water. If a small quantity of wine be poured on quicklime, and if the lime be slackened by it, the wine then certainly contains water. But if the lime continues whole, the wine is pure and unmixed.

Ardent spirits comprise all those liquors obtained by fermenting vegetable, and particularly farinaceous substances, to a certain degree, and afterwards subjecting them to distillation. All distilled liquors consist of a great proportion of alcohol or pure spirit, a greater or less quantity of water, and generally of a very small proportion of an empyreumatic oil, especially if distilled once only, or if this process be carried on too quickly. Pure spirits are perfectly free from this oil, which, from its burnt and acrid nature, is altogether indigestible. Proof spirits ought to consist of 55 parts of alcohol, and 45 of distilled water in 100 : but rectified spirits of wine ought to have only 5 parts of water in the hundred : the specific gravity of the former being as 930, and that of the latter as 835, to 1000.

The intoxicating effects of spirits are but too well known ; if they be distilled over peppermint, balm, anniseed, or carraway, their strength is not much increased ; but if over cinnamon, cloves, mace, or other hot spices, they are rendered still more heating, and pernicious to health.

If drunk in hot weather, or after violent perspiration, they check this function, by contracting the vessels of the skin, and closing the pores. On account of this contracting power, they are sometimes of service to a person whose stomach is overloaded with beer or water, to assist their passage through the proper emunctories. After violent exercise and heat, a dram of spirits is more proper than cold water or beer, though a cup of tea or other diluent drink is preferable. After fat or strong food, spirits are exceedingly improper: for, instead of promoting the solution and digestion of food in the stomach, they rather tend to retard it. We may be convinced of this, by attending to the effects they produce on inanimate substances: for these are preserved from dissolution and putrefaction more effectually in spirits, than in any other liquid. Thus we may learn, that spirits will impede digestion, and render strong food taken into the stomach still more indigestible. Many persons are accustomed to take a dram as a remedy against flatulency: if the stomach be clean and undepraved, they will certainly be relieved by it; but, in the contrary case, their expectations will be disappointed.

Ardent spirits are rendered still more contracting, and prejudicial to the stomach, when combined with acids, as in punch; and, for the same reason, the habit of taking drams after fruit, or any acid vegetable, is absurd. Notwithstanding the frequent abuse of spirits, they afford one of the most excellent antiseptics; but, if the human body be already re-

plete with vitiated humours, and troubled with frequent eructations, it is too late to cure it with gin or brandy. These liquors, however, are of considerable service in preventing the bad effects of a moist and cold atmosphere, of pestilential vapours, of very unclean occupations, of a damp military camp, and occasionally too, of a temporary abstinence from food.

To persons of relaxed fibres, distilled liquors may, under certain limitations, be useful, as they increase the elasticity and compactness of the vessels. But to those, whose fibres are already rigid, spirits are obviously pernicious, and have a tendency to bring on a premature old age. They stop the growth of, and are otherwise very improper for, young persons.

That spirituous liquors inactivate and coagulate the fluids, we may easily discover in those who are addicted to the use of them: they have a thick blood, are troubled with constant obstructions of the intestines, and their unavoidable consequences; such as a gradual deprivation of the nervous system, loss of memory, debility of mind, hypochondriasis, jaundice, dropsy, and at length consumption of the lungs. The throat and stomach of habitual tipplers are rendered callous, and at length almost closed, the glands are indurated, and consequently digestion is in the highest degree impaired.

Beer, considered according to its ingredients, consists of water, malt, and hops;* and

* Besides these ingredients, Brewers are apt to add a number of other substances, some of which are extremely noxious, and all

in proportion to the quantity, quality, and manner of compounding them, it has received different names, and is possessed of various degrees of salubrity. The more water there is used in brewing beer, it is the better calculated to quench thirst; but less so, if it contain a great proportion of the mucilaginous and saccharine principle of the grain. Strong beer, therefore, is very nourishing, and may be employed with advantage as a medicine, in emaciated habits.

The greater or less addition of hops to the malt, furnishes us with bitter or sweet beer. The former kind is preferable as a medicine; the latter is more used as a common beverage; but it is apt to excite flatulency and diarrhœa. Hops, like other bitter substances, preserve beer in its vinous state, strengthen the stomach, and dissolve viscid phlegm. Beer made of a great proportion of hops, and a small quantity of malt, is a good beverage, and well calculated to allay thirst.

There are great varieties in beer, accordingly as it is fermented; some kinds, such as those made of oats, in some parts of Germany, which are scarcely allowed to ferment at all, are very cooling in summer, but soon spoil; others are only half-fermented, such as the Dantzig spruce or black beer; others again

prohibited by law. These are *Cocculus Indus*, Coriander Seeds, Alum, Liquorice and Liquorice Root, burnt Sugar, Treacle, Capsicum, Ginger, Copperas, &c. &c.—An useful pamphlet has lately been published, called "*Every Man his own Brewer*," detailing this manufacture, and, at the same time, shewing practically, how any private family, or even lodgers, may make Porter and Ale in the smallest quantities, at less than half the expense at which these articles are purchased.

to a sufficient degree, like our porter and ale; and lastly some, which are more than sufficiently fermented, such as Burton ale, and most of the strong home-brewed ales. All these are different in their effects, according to the various degrees of fermentation.

Every kind of beer is inclined to ferment, on account of its constituent parts. If it be not properly fermented, this takes place in the stomach itself; the fixed air, being disengaged within the body, distends the stomach and bowels, and occasions flatulency and looseness. However, when drunk in small quantities, it is not attended with any great inconvenience, particularly in summer, or in hot climates. It is used with great advantage at sea, against that great enemy of the mariner, the scurvy; those persons who have corrupted gums, that are painful and bleed on the least touch, ought to drink half a pint of wort, or unfermented beer, every morning and evening, keeping this liquor for a good while in their mouth; and they may promise themselves great benefit from this simple remedy.

Many consider beer or porter as excellent, when it foams much and makes a head, as it is called, on the top of the vessel; which is drunk by some tipplers with avidity, before it disappears. But this froth is not a proof of its good quality; but rather of its imperfect fermentation, which is continued and completed in the stomach. It is likewise often artificially increased, by the addition of improper ingredients. The volatile vapour, or gas, disengaged from such beer in the sto-

mach and bowels, produces a quantity of stimulating and contracting air, by which the alimentary canal is almost at the same time expanded and contracted, so that the most dangerous spasms and colics may thence arise. Such beer likewise emits a quantity of sulphureous vapours; and for this reason it is dangerous to go into cellars, where it is kept in a state of fermentation. A candle will often be extinguished by the vapour of cellars, which is sometimes so noxious as to suffocate persons on their entrance.

If bottles filled with beer, ale, or porter, are not soon enough corked, it turns flat or sour, acquires an unpleasant taste, produces flatulency, colics, and spasms. If bottled and corked in proper time, the gas which it ought to contain is not dissipated; its agreeably pungent taste is preserved, and it is then a very excellent and nourishing liquor, which allays thirst, and does not affect digestion, like wine.—A person who has a good appetite, and takes nourishing food, requires no beer for its digestion; and, by drinking it, he is exposed to plethora, or a full habit, and all its concomitant complaints. Those, on the contrary, who take a great proportion of vegetable food, and have a weak stomach, will find a strong and bitter beer salutary.

As every new sort of beer is not equally grateful to the stomach, we would do well to desist from using that kind, to which we cannot habituate ourselves in the course of two or three weeks. On account of the great variety of this liquor we meet with in travel-

ling, it is much better to drink no beer at all on journeys, and instead of it to use lemonade, in hot weather, and wine or spirits mixed with water, when we travel in a damp and cold season.

Beer, in general, is nourishing, and has a tendency to fatten such individuals, as are of dry and rigid fibres, and whose bile is good. Hence the inhabitants of countries, in which beer is the principal beverage, are commonly more phlegmatic and indolent than those of wine-countries. Many sorts of beer, however, in which a greater than usual proportion of grain is used, contain much spirit, and are of a heating and inebriating nature. Such is, for instance, our Burton and several other ales, and all the strong kinds of foreign beer.

Light and well-fermented beer is a wholesome and, at the same time, diluent species of nourishment. With persons already plethoric, or disposed to become corpulent, the lightest beer generally agrees best. Thick and nourishing beer is of service to wet-nurses and the debilitated. Sweet beers are only nourishing, but all the bitter kinds are strengthening also. The latter are beneficial in a weak state of digestion, and to people troubled with acid in the stomach; yet sweet beer is more wholesome for daily use, and at the same time less exposed to dangerous adulterations. In short, beer is no proper beverage for people of a thick, black-bilious blood, and with a disposition to melancholy: it is the most useful species of drink to the weak, the lean, and the

laborious; provided they are not very subject to flatulency, nor troubled with diseases of the breast. In both of these cases, I have found it uniformly to disagree, and to be much inferior in salubrity to water.

A moderate use of fermented or distilled spirituous liquors is far less prejudicial to the constitution, than the habitual and excessive drinking of warm liquors. *Tea*, the common favourite among all ranks, if taken regularly twice a-day, and in large quantities, is attended with bad consequences. It thoroughly relaxes the coats of the stomach, weakens the bowels, predisposes them to flatulency upon the least occasion, and destroys all the energy of the digestive organ. These effects, however, are not so frequent, nor indeed to that extent, if the tea be drank strong, sufficiently diluted with milk, and sweetened with sugar: it is chiefly the warm water, which renders the tea of the common people so destructive to the constitution, as they generally make up for the indifferent quality of the tea, by the quantity of water.

The tea-leaf, which has employed the pens of so many eminent writers, still deserves some attention; as the nature and properties of it are but imperfectly understood. It certainly is an aromatic, slightly astringent, and somewhat narcotic plant. Whether it possess any diuretic, diaphoretic, and other virtues, for which it has been celebrated, is rather doubtful; as these may be in part owing to the great quantities of warm water, with which the infusions of it are made. Good tea, particularly the black sort, in moderate quantity,

and made strong, is antispasmodic and refreshing. It is, therefore, calculated to relieve the cramp of the stomach, and pains of the abdomen, if they proceed from flatulency. But, according to circumstances, it may even increase spasmodic contractions; for instance, if it arise from a vitiated bile, from worms, or from hystERIC and gouty complaints; in all which cases tea will most certainly not relieve, but rather prolong the spasmodic contraction of the vessels. The relaxation which tea occasions in the first passages, renders it peculiarly hurtful to females of lax fibres, a thin blood, and irritable habits. To enumerate the great diversity of nervous symptoms, attending its abuse in such constitutions, would lead me too far from the prescribed limits; but so much is certain, that the vapours arising from liquors drunk very hot like tea, weaken the lungs, and dispose their votaries to frequent colds and catarrhs, which readily make a transition into consumptions.

Individuals of a rigid and solid fibre, of a dry and firm body, may be allowed to drink tea in moderation, as it will not easily hurt them. By adding a table-spoonful of old Rhenish wine, or ardent spirits, to every cup of tea, it may be so far improved, as to make it less flatulent; but the frequent repetition of it, even in this form, must be detrimental to the body. A moderate use of tea may sometimes be of service to persons in a perfect state of health; yet, for daily use, it cannot be recommended. It doubtless occasions a gentle stimulus, and rouses the mind for a short time;

hence it is perhaps the best and safest refreshment after violent heat and fatigue of the body. As the means of increasing perspiration, tea is an useful beverage to travellers in cold weather, when insensible perspiration is liable to be checked.

Hypochondriac and hysteric people, however, are much deceived in the efficacy of tea, as a diluent drink; for all the evils arising from relaxation, a weak stomach, and flatulency, under which such persons usually labour, are, by the habit of drinking tea, increased to the most alarming degree. The *cold* stomach, which they propose to *warm* by it, is a mere phantom of the brain; for this sensation of cold is nothing but relaxation, which cannot be removed by *hot* liquors, but is increased by every repetition of them.

It would be a great proof of a patriotic spirit in this country, if the use of this exotic drug were either altogether abandoned, or, at least, supplied by some indigenous plants of equal flavour, and superior salubrity. The Chinese have good reason to smile at our degenerate taste, when they are informed, that we actually possess an immense variety of the most valuable aromatic plants, much better calculated by nature to invigorate our stomachs, and to revive our spirits, than tea, which we purchase from them at great expense. These sentiments may be ungrateful to tea-dealers, or East-India merchants, but every honest truth should be candidly told to an unbiassed public.

It would undoubtedly be more conducive to our health, if we could altogether dispense with the use of warm liquors, at least when in a state of health. But, if this practice must be indulged in, we ought to choose the herbs growing in our own meadows and gardens, instead of making ourselves tributary to distant nations. With this intention, the late Dr. Solander introduced his *Sanative Tea*; not with a view of making it a secret or quack-medicine, under which character it is now sold in this country, but of recommending the use of it to those individuals who require diluent liquors, and to the heavy, sluggish, and phlegmatic. Dr. Tissot had previously recommended the stalks of cherries, and the leaves of peach and almond trees, to the poor people of Switzerland, as substitutes for tea; but we possess a variety of plants infinitely superior to these, of which I have myself occasionally made trial. I shall divide these into three classes; namely,

1st, The strong, spicy, and balsamic plants, such as balm, peppermint, sage, and the like.

2d, The strongly aromatic flowers, among which those of the *Rosa pimpinellæ folia* (or the rose whose leaves resemble those of the Burnet-saxifrage) and the *wood-rose*, or the *Asperula odorata*, L., deserve the first place, and far excel in flavour all the teas imported from China; and lastly,

3d, The mild aromatic leaves and blossoms of trees and shrubs, for instance, the blossoms of the lime-tree and the black thorn, the leaves of the peach and almond-trees, and particu-

larly the first tender leaves of the *whortleberries*, or the *Vaccinium Myrtillus*, L., which cannot be distinguished from real tea, when properly gathered, and dried in the shade.

After having pointed out the best substitutes for Indian Tea, I cannot suppress my earnest wish, that even these indigenous vegetables may not be abused by decocting them in too much water, which, when swallowed hot, must be detrimental to the stomach, the lungs, the nerves, and the whole human frame. I cannot better conclude this important article, than by quoting the prophetic words of an experienced physician.—“Tea,” says he, “will induce a total change of constitution in the people of this country. Indeed it has gone a great way towards effecting that evil already. A debility, and consequent irritability of fibre, are become so common, that not only women, but even men are affected with them. That class of diseases, which, for want of a better name, we call nervous, has made almost a complete conquest of the one sex, and is making hasty strides towards vanquishing the other.” And Dr. Buchan emphatically concludes: “Did women know the train of diseases induced by debility, and how disagreeable these diseases render them to the other sex, they would shun tea as the most deadly poison. No man can love a woman eaten up with vapours, or washed down with diseases arising from relaxation.”

Coffee is a decoction of the well-known bean or berry of that name, roasted and ground into a powder. The bitter and astringent

powers of the beans, in some measure, correct the bad properties of warm water ; but if they be too much roasted, their empyreumatic oil is expelled, and they acquire an insipid taste. If, on the other hand, they be not sufficiently roasted, this burnt oil is not evolved to the surface of the bean, and the coffee acquires a bitter and unpleasant flavour. This beverage is generally considered as strengthening to the stomach. It promotes digestion, dispels flatulency, removes vertigo and torpor, exhilarates the mind, increases the circulation of the blood and insensible perspiration, attenuates viscid humours, is diuretic, and sometimes gently aperient. These properties of Coffee being, in a great measure, confirmed by experience, justly make it a valuable medicine, which is eminently qualified to cure the most troublesome head-achs, provided they originate from the stomach, or from a bad state of concoction. Coffee drunk after dinner promotes digestion ; and agues, diarrhœas, and giddiness, have been frequently removed by it. Its subtle oil stimulates the solids, rarefies the blood, and consequently is of particular service to females of a sedentary life, and to those who suffer from phlegmatic and catarrhal diseases. If drunk too strong, it affects the nerves, and by its penetrating property often occasions sleeplessness, and tremor of the hands ; but, in some phlegmatic and indolent individuals, it is apt to excite sleep.

If coffee be not used merely as a diluent for relaxing the fibres, it ought to be made strong. The best proportion is, one ounce of

well-roasted and ground coffee to one pound or one pint of water, which should be just allowed to boil up : for the longer it is boiled, it loses the more of its volatile and aromatic particles, and consequently becomes weak and insipid.—As coffee is possessed of excellent antispasmodic virtues, it is a favourite beverage with the hypochondriac and the hysteric ; and according to early observation, it is also the best and most effectual remedy in spasmodic asthma.

The steam of boiled coffee has frequently been beneficial to weak eyes. If drunk in the morning, and immediately after dinner, of a proper strength, and not above one or two small cups, it is a wholesome substitute for tea or spirits, particularly to persons in a good state of health, and to such as are not habitual wine-drinkers, or of a very irritable temperament.—Lastly, the coffee of the Levant far excels that imported from the West Indies, which is frequently steeped in sea-water, in order to make it weigh heavier. This fraudulent practice may be easily detected, by soaking the raw coffee in water, and examining its taste.

An *immoderate* use, however, of this decoction is prejudicial to the healthy, and destructive to the diseased : it debilitates the latter still more, by causing great undulations in the blood, tremor of the limbs, giddiness, and a certain insupportable timidity. It leads people of a sanguine temperament, and particularly females, to the long train of all the fashionable nervous diseases. It frequently occasions a disagreeable eruption in the face, and brings

on many troublesome disorders, occasions bleedings of the nose, and sometimes spitting of blood, induces frequent hemorrhoids, a hectic cough, and at last consumption and death.—If coffee be drunk after dinner, with a view to promote digestion, it requires no milk to dilute it, and render it weaker : but, if it be used for breakfast, some milk or cream is necessary, to sheath or neutralize the empyreumatic oil it contains, which fires the blood, and occasions violent flushings, accompanied with cholerick sensations.

All the kinds of mock coffee, made of rye, wheat, peas, dried carrots, beet, the succory-root, and the like, have little resemblance to it, except what they acquire by their burnt taste and empyreumatic oil. A coffee made of acorns is much recommended in asthmatic and spasmodic complaints ; but as it contains an uncommon quantity of oil, which is dangerous and heating to the blood, too much circumspection cannot be employed in the use of it. From my own experience, I recommend to begin with adding about one eighth, then one sixth, and gradually a greater part of the burnt acorns to the coffee, till at length they may be used in equal quantities.

Chocolate, especially when boiled with milk and eggs, is exceedingly nourishing : but the spices with which it is mixed, such as cinnamon, cloves, musk, vanilla, and the like, make it more heating and less wholesome. Vanilla, which we always find in the Spanish Chocolate, is an extremely volatile and pungent aromatic ; even its flavour is frequently insupportable to

hysterical and hypochondriac persons ; it occasions violent head-ach, trembling, giddiness, and other symptoms, occurring in these complaints. The common chocolate, prepared with sugar, eggs, milk, and water, is the most nutritive and wholesome ; but a too frequent and immoderate use of it is always hurtful, particularly to the individuals before alluded to, as the cacao is too fat and indigestible to them, and creates a false or forced appetite. *Cacao*, of itself, is less heating and lighter than if made into chocolate, but it is not so nourishing. The immoderate use of this oily beverage is apt to induce a febrile state in young people, and to supply the sedentary with superfluous nourishment ; while it frequently brings on, like coffee, a state of irritability and uneasiness. To the corpulent and weak it is improper ; and if they be immoderate eaters, they are hastening to contract inflammatory diseases and apoplexies. It also disagrees with persons much employed in mental pursuits ; and those who imagine that it will supply their losses, sustained by nocturnal debaucheries of whatever kind, will find themselves disappointed in their hopes : by continually drinking chocolate, and using other nutritive substances, they will, indeed, be stimulated to new irregularities, but eventually at the expense of their palsied nerves, and their broken frame. In children threatened with a wasting, or *tuberculosis*, as likewise in some kinds of consumption in adults, Chocolate, with a sufficient quantity of milk, may be beneficial ; but even in these cases a strong decoction of roasted

oatmeal in milk, with a small addition of chocolate, is much better calculated to effect a cure.

Punch is a well-known beverage, the composition of which requires no description, as it may be made of every kind of spirituous liquor, diluted with water, acid and sugar. If a proper quantity of acid be used, it is an excellent antiseptic, and well calculated, to supply the place of wine, in resisting putrefaction, especially if drunk cold and with plenty of sugar: it also promotes perspiration; but, if drunk hot and immoderately, it creates acidity in the stomach, weakens the nerves, and gives rise to complaints of the breast. After a heavy meal it is improper, as it may check digestion, and injure the stomach.

Negus is one of the most innocent and wholesome species of drink, especially if Seville oranges be added to red Port wines, instead of lemons; and drunk moderately, it possesses considerable virtues in strengthening the stomach; but, on account of the volatile and heating oil in the orange-peel, negus, if taken in great quantities, is more stimulant and drying than pure wine itself. Persons troubled with the hemorrhoids, and diseases of the breast, should not indulge themselves in this, nor in the preceding species of drink.

I cannot conclude this section without mentioning vinegar and oil, two substances which partly belong to the department of drink, and partly to that of spices.

Vinegar is an excellent preservative of animal substances from putrefaction, especially in a warm temperature ; and I cannot but regret that this invaluable liquor is too little used in our kitchens, as well as upon our tables. It promotes digestion, and is perhaps never communicated to the blood in its acid state : hence it is an erroneous notion, that vinegar is detrimental to the secretion and quality of the milk in wet-nurses. In some individuals, however, it is apt to produce a sudorific effect, and even laxity of the bowels, on account of its astringent property. Used with moderation, as an article of seasoning rather than drink, especially in warm weather and with animal food, it is both savoury and wholesome. But we ought to be careful to obtain *good* vinegar ; for various kinds of it, which are made of flocs, the husks of nuts, and other strong astringents, certainly are pernicious to health. The best and most palatable vinegar is that obtained from white wines, raisins, and sugar.

Oil is preferable to animal fat, but ought to be fresh, mild, and of a sweetish taste. It seldom or never agrees with weak stomachs ; for in them, even in its mildest state, it easily generates a rancid acrimony, extremely injurious to digestion. It should be eaten with much bread, when used in salads or otherwise, as it requires a powerful and active bile to assimilate it to alimentary matter. Olives and almonds yield the greatest quantity of oil ; and next to Province oil, that expressed from walnuts and chefnuts, is the sweetest, and easiest of digestion.

Of Spices.

Spices, of themselves, are not nourishing, but are used merely to improve the taste and flavour of substances, to prevent flatulency, and to promote digestion. Some spices, being extremely volatile, and occasioning too strong a stimulus, do more harm than good. As they are apt to heat the blood, to increase perspiration, occasionally to affect the head, and to stimulate the nerves, spices, in general, should be used only by persons possessing a strong constitution, or by those of a lax fibre, and cold phlegmatic habit: as, on the contrary, individuals naturally lean and dry, as well as the choleric and phlegmatic, ought to be sparing and cautious in the use of heating spices. The most conducive to health would be the indigenous spices, though some of the foreign kind have now become indispensable in our present mode of living. The most common, and perhaps the most useful, are:

1. *Salt*. It corrodes the fibres of plants and animals, disorganizes the connection of parts too firm for the solution of the stomach, dissolves the glutinous parts, and prepares them for being better digested by the stomach. Provisions of a tough and viscid consistence, therefore, require much salt; for instance, beef, mutton, fish, peas, beans, fat, &c.*—Hence

* There is little danger of using too much salt with *fresh* victuals, as the only consequence arising from excess would be a slight laxity of the bowels.—In order to obtain salt as pure as possible, and free from the bitter magnesia, which is the great promoter of putrefaction, I take this opportunity of recommending an ingenious and simple process lately invented by *Lord Dundonald*, one of the most zealous and able cultivators of the useful arts: Dis-

salt beef and herrings agree so well with vegetables, because the abundance of salt in the former, seasons the latter. But too copious a use of salted provisions is extremely prejudicial; they weaken the solids, and the blood becomes thin, acrid, and disposed to putrescency; hence arise scurvy in all its stages, eruptions of the skin, consumptions, and other diseases.

2. *Sugar* is at present one of the first necessities of life. It is an unfounded conjecture, that sugar renders the blood thick or viscid; on the contrary, it is possessed of diluent and attenuating properties. But the immoderate use of sugar, especially the moist and coarse sort, may in a considerable degree prevent digestion, by consuming the oleaginous part of our fluids, impeding the assimilation of food, and generating mucus and acidity in the alimentary canal.

It has frequently been asserted, that sugar injures the teeth: this, however, is not strictly

solve as much common salt in a given quantity of boiling water as it is capable of containing in solution. Take another quantity of salt not larger than the former, and put it into a glass funnel, or similar vessel of wood or earthen-ware, which ought to be lined with coarse thick linen cloth. While the strong brine is hot, pour it over the dry salt, of which it will not dissolve a particle, but merely wash away the magnesia and other impurities adhering to its surface; and by repeating this effusion several times, the washed salt will become tolerably pure. The whole of this process depends on the principle, that water can dissolve only a certain quantity of salt, and that the magnesia may be washed away by such a supersaturated solution, while the salt to which it adheres remains insoluble. Salt thus purified will doubtless be more wholesome, and more effectual for all the purposes of salting and pickling provisions; as the magnesia contained in the common salt renders double, perhaps triple the quantity necessary, which would be required, were it in a pure state, or deprived of the magnesia.

true ; for it is only by its vitiating the stomach, and generating impure blood, that the teeth become sympathetically affected. Hence persons of weak digestion, those with debilitated nerves, the hypochondriac, hysteric women, and especially children subject to complaints arising from worms, ought to use this luxurious substance sparingly, and only occasionally. If moderately used, it promotes digestion, being a gently solvent and stimulating salt. But, where people take it without moderation, sugar may prevent digestion, not on account of its substance, but by obstructing the assimilation of food, so that it produces slimy and acid matters in the alimentary canal. The acid which sugar contains, renders it an excellent remedy against putrescence. The finest sort of sugar being freed of all impurities, is the best and most wholesome. Yet, in sore throats and other catarrhal affections, I would prefer sugar-candy or moderately fine loaf-sugar, to that which is double refined, on account of some particles of lime and clay, necessarily remaining in the latter, from the manner in which it is prepared.—Other sweet substances, such as honey, cannot altogether supply the place of sugar, as they are not possessed of the same properties ; but there have been already made some very successful experiments with the American maple-tree, (*Acer saccharinus*) which afford great hopes that we may obtain this valuable and indispensable salt, in future times, from that quarter of the globe, in sufficient quantities, and at a reasonable price, when the most flagitious of all

trades, that in human flesh, shall have been entirely abolished.*

3. *Honey*, like sugar, contains an acid, but many more inflammable particles; it easily ferments, and therefore occasions flatulency. In some particular habits it is apt to occasion gripes and looseness: as a medicine, it is useful to the asthmatic, to promote the expectoration of tough phlegm; and so far it is an useful detergent and aperient. But, as a part of diet, when immoderately used, it is hurtful to weak stomachs, and ought to be avoided by people who are troubled with a superabundance of bile, and whose humours incline to putrefaction.

4. The different species of *Pepper*, being strongly heating and stimulating, should be used with precaution. Yet its peculiar warming and stomachic virtues make it an excellent spice, and proper to be used with fat, tough, and smoked meat, with flatulent vegetables, with the cooling cucumbers and melons, as well as with fish and other substances difficult of digestion. Pepper ought, for these purposes, to be coarsely ground. If taken in whole grains, it imparts to the stomach only a small part of its virtues, and cannot be reduced in digestion. In this form it is an old and effectual domestic remedy of the Germans, against viscidities in the stomach, flatulency, weak digestion, and consequent giddiness. For these purposes, from six to ten pepper-

* I must on this occasion refer the reader to the account I have given of the *beet-root*, (p. 81.) which promises to become an invaluable, copious, and permanent substitute for sugar.

grains should be swallowed in the morning, on an empty stomach. Yet I would not advise this practice to be followed, except to some very vitiated stomachs, which have been accustomed to spices and spirituous liquors, and with whom the pepper may serve as a substitute for drams.

5. *Cubebs*, *Cardamoms*, *Vanilla* and *Cloves*, are hot, pungent, and consequently improper for daily use.—*Cubebs* are much inferior in pungency to pepper.—*Cardamoms* are a warm and grateful aromatic; they do not, like those of the pepper kind, immoderately heat and inflame the bowels; hence they certainly deserve the preference for common use.—*Vanilla** is warming, resolvent, strengthening to the stomach, and a remedy for flatulency. In chocolate, it assists the digestion of the oily substance of the cacao.

Cloves are hot and stimulant aromatics, but formerly seldom obtained genuine in this country, as the Dutch frequently mixed them with other cloves, previously deprived of their essential oil by distillation.—*Mace* and *Nutmeg* are less heating, and therefore preferable for common use; but the former is still more

* *Vanilla* is the pod of the *Epidendrum*, L. growing in Cayenne and some parts of Spanish America. The largest pods are sometimes six inches long, narrow, and almost triangular, soft, oleaginous, externally of the appearance of leather, and internally filled with a dark brown pulp, in which we find a great number of small black or brownish red and shining seeds. These have a pungent aromatic and oily taste, and a strongly balsamic odour, much resembling that of the Peruvian balsam. A very small proportion of these seeds, for instance, a grain to an ounce, is sufficient to impart to the Chocolate the very agreeable flavour which we generally meet with in that imported from Spain and Milan.

so than the latter, which is supposed to have an astringent virtue, and is employed with that intention in diarrhœas and dysenteries.—*Cinnamon* is undoubtedly the most delicate spice, but is seldom obtained pure from the mercenary Dutch, who were accustomed to send us more Cassia than real cinnamon. The *Cassia* bark, though resembling that of cinnamon in taste, is much less heating, and certainly more beneficial for common use than cinnamon, which is better calculated to answer medicinal purposes. The bark of cassia is thicker and coarser; it breaks short and smooth, while the cinnamon breaks fibrous and shivery.—*Pimento*, or Jamaica pepper, resembles in its smell a mixture of cinnamon, cloves, and nutmeg, whence it has received the name of *all-spice*; it is milder than the East-India pepper, and is an useful addition to broths and stewed dishes, when used, as it ought to be, in whole grains.—*Ginger* is one of the most agreeable and wholesome spices, especially boiled whole in beer, and drunk by people moving in the open air, and in cold weather. But this spice, as employed by the bakers for gingerbread, does a great deal of mischief, especially to the stomachs of children; though it may occasionally be serviceable to travellers, early in the morning, and on an empty stomach.*

* If the bakers knew what the substance is, with which they gild its outside, to invite children to eat their ill-contrived gingerbread, I venture to hope they would desist from so pernicious a practice. This gold leaf, or Dutch gold, is actually manufactured of brass or copper, one of the most virulent metallic poisons.

The indigenous, spicy, and balsamic herbs, such as *parsley*, *marjoram*, *thyme*, *sage*, and the like, cannot be too much recommended for culinary use, especially in broths ; as they are well calculated, by their aromatic virtues, to assist the digestion of many strong articles of food, which daily cover our tables ; and these excellent herbs are not liable to the adulterations with which most of the foreign spices are vitiated.

6. Among all the native spices, there is none, in my opinion, which excels, in medicinal virtues, the common *Caraway*. The seeds of this plant are the mildest and most useful carminative we possess. To people of a weak digestion, troubled with flatulency and colics, they afford the most certain relief, if used in sufficient quantity ; for instance, a table-spoonful at a time, early in the morning, and one hour before a meal : or still better, if these seeds are plentifully used in bread, and among cooked victuals. Yet here I must caution those of a hot and bilious temperament, as likewise individuals liable to obstructions and habitual costiveness, not to use these seeds indiscriminately, and without consulting a professional man.

Caraway-seeds, finely pounded, with a small proportion of ginger and salt, spread upon bread and butter, and eaten every day, especially early in the morning, and at night before going to bed is successfully used in Germany as a domestic remedy against hysteries, and will, no doubt, effectually cure the disease, provided it does not arise from improper

diet, obstructions of the intestines and other vessels, passion, bile, acrid humours, and the like ; in all which cases the caraway and ginger will certainly do more harm than good ; as each of these causes must be removed by the apposite means.

If, however, caraway be kept in a pounded state, for the purpose of overcoming the disposition to flatulency and indigestion, it soon turns rancid, and may prove hurtful, on account of the strong oil it contains.—The plant of caraway is one of the early spring-herbs, and makes an excellent addition to salads. The seeds, when distilled with ardent spirits, yield a very heating and pernicious oil, which renders such spirits still more detrimental to health, than when they are in a pure state.

CLAS-

CLASSIFICATION

Of the various Species of Food, Drink, and Spices, according to their individual salubrity.

I. FOOD.

Division First.

Alimentary substances containing wholesome fluids.

CLASS I. Articles affording strong nutriment.

ORDER I. Vegeto-farinaceous substances.

Genus, i. With soft juicy fibres.

1. *Such as contain a saccharine matter ; as the skirret or sugar-root (Sium Sifarum, Linn.) the common carrot, beet, and polypody-root (Polypodium vulgare, L.)*
2. *Sweetish substances affording a tender farina or meal ; as the parsnip, the turnip-rooted cabbage (Napobrassica,) the colewort (Caulis Rapicius,) viper's grafs (Scorzonera, L.) the goat's-beard, or salsafy (Tragopogon Pratense, L.) the Solomon's seal (Convallaria Polygonatum, L.) parley-root, asparagus, turnips, and potatoes.*

Genus ii. *Substances affording flour, or those of a viscous, earthy consistence ; viz. every species of grain, as wheat, rye, barley, oats, buck-wheat, millet, maize, or*

Indian-Corn, the chickling-vetch (*Lathyrus Tuberosus*, L.) and the like.

ORDER II. Gelatinous animal substances.

Genus i. Of a soft and juicy muscular substance; viz. veal, lamb, young beef, mutton, pork, venison, turtle, hare, rabbits, badgers, domestic fowls, pheasants, partridges, the greater number of land-fowl, oysters, small lobsters, and fresh eggs.

Genus ii. Of a hard and tough consistence; viz. all the animals before mentioned, when old; as well as the bustard, the starling, the woodpecker, the sparrow, the goose, the duck, the lapwing, muscles, snails, crabs, hard boiled eggs, &c.

ORDER III. Fat or butyro-oleaginous substances.

Genus i. Of the sweet kind; viz. cacao, sweet almonds, walnuts, hazel-nuts, water-caltrops, chesnuts, beech-nuts, cashew-nuts (*Anacardia*,) pistachio-nuts, wild pine-apples (*Karatas*,) milk, and fresh cheese.

Genus ii. Of the bitterish and tart kind; viz. bitter almonds, acorns, all the feeds of fruit, and olives.

CLASS II. Slightly nutritive substances.

ORDER I. Those of a viscous and watery consistence, or whose vegetable mucilage is diluted with much water.

Genus i. Of a sweet taste; viz. melons, and several species of pears and apples,

sweet citrons, lemons, oranges, figs, mulberries, raspberries, sweet grapes, cherries and plums, jujube-berries, dates, &c.

Genus ii. Of a sweetish taste ; viz. green peas and beans, white cabbage, cauliflower, spinach, orach, blite, or strawberry-spinach, cucumbers, and gourds.

*Genus iii. Of a compound sweet and bitter taste ; viz. the succory, the rampion (*Phyteuma*, L.), the borage, the sow-wort (*Serratula*, L.), the young shoots of hops, the sow-thistle (*Sonchus*, L.), the hedge-mustard, artichokes, capers, the brook-lime, endives, and lettuce.*

*Genus iv. Of a mildly sweetish and spicy taste ; viz. celery, angelica, shepherd's-needle (*Scandix cerefolium*, L.), fennel, and the common balm (*Melissa officinalis*, L.)*

*Genus v. Of an acrid taste ; viz. radishes, turnip-radishes, horse-radishes, tarragon (*Artemisia Dracunculus*, L.) scurvy-grass, and rue.*

*Genus vi. Of an acid taste ; viz. sorrel (*Rumex acetosa*, L.), purslane (*Portulaca*, L.), sour citrons, lemons, limes, cherries, plums, &c.*

*Genus vii. Of a vinous quality ; viz. all sweet apples, particularly renetts, apples of Borstof, and some few varieties from America ; the pine-apple (*Ananas*), the honey or paradise-apple,*

shaddock, or sina-apples, bramble-berries, straw-berries, whortle-berries, goofberries, currants, grapes, apricots, peaches, and nectarines.

Genus viii. Of a tart and astringent taste; viz. all the wild-growing apples and pears, quinces, cran-berries, red whortle-berries, bar-berries, the green summer and winter pears, four apples, medlars, the fruit of the dog-rose or hip-tree, and of the service-tree, sloes or the fruit of the black-thorn, and the green Brazilian plums.

ORDER II. *Those of a gelatinous watery consistence.*

To this order belong all the various species of fishes.

Division Second.

Alimentary substances, containing unwholesome fluids.

ORDER I. *Those of an acrid nature.*

1. *Coarsely viscous and saline substances; viz. all salted and smoked animal food, both of quadrupedes and fishes.*
2. *Putrescent, or easily putrescible substances; viz. the ram, the he-goat, the bull, the otter, water-fowls, the blood of animals, roasted eggs, tainted eggs, and lastly all the flesh of wild and tame animals kept too long, with a view of making it more tender.*

3. *Substances of a furry and leathery appearance, or such as discover a suspicious acrimony*; viz. truffles, morels, and all kinds of mushrooms.

ORDER II. *Those of gross fluids, or a coarse earthy consistence*; namely, the various leguminous seeds, such as dried peas; beans, lentils, and the like.

II. DRINK.

(A) Watery Liquors.

I. *Simple or uncompound*ed; namely all kinds of common water.

II. *Mucous-watery-spiritous*.

1. All *fermented* liquors known under the name of beer or ale.
2. *Spicy-balsamic* liquids; such as the vernal sap of the birch and maple-trees, as well as the artificial preparations of tea, coffee, and chocolate.
3. *Sweetly-acidulated*; namely, lemonade, orgeat, mead, must, and the like.

(B) Spirituous Liquors.

I. *Distilled*: namely, all kinds of ardent spirits, from whatever grain or vegetable substance they may be extracted.

II. *Fermented*: All kinds of Wine.

1. *Sweet wines*; those of Hungary, Spain, Italy, Greece, and the Cape wine; as likewise all wines made of currants, raisins, &c.

2. *Slightly acidulated wines* ; among which Champaign, Rhenish wine, or old Hock, and that of the Moselle, are the principal.
3. *Acid and tart wines* ; to which chiefly belong the wines of Franconia and Saxony.
4. The *acidulated sweet wines* ; such are most of the French wines, and particularly Claret ; and, lastly,
5. The *sharp and astringent wines* ; the chief of which are the wines of Oporto and Burgundy.

III. SPICES.

1. Of the *sweet* kind ; such as sugar, honey, manna, and the inspissated sap of the maple and beech-trees.
2. Of the *acid* kind ; namely, the juice of citrons, lemons, unripe grapes, &c.
3. Of the *saline* kind ; namely, common salt, whether obtained in a solid form, as rock-salt, or from the evaporation of the sea and salt-springs. Lastly,
4. Of the *pungent and balsamic* kind ; such as garlic, shallot, onions, chives, nutmeg, mace, pepper, pimento, cubebs, vanilla, cardamoms, bay-berries, juniper-berries, ginger, calamus, cloves, cinnamon, saffron, carraway, coriander, fennel, parsley, dill, sage, marjoram, thyme, penny-royal, mugwort, hyssop, peppermint, and rue.

C H A P. VIII.

Of EVACUATIONS ;—their different species, as well as their peculiar nature investigated ; together with the necessary directions for their management, according to the different states of the body.

THE evacuations of the body, from its superfluous, impure, and noxious particles, are no less necessary than its nourishment. The same power which changes and assimilates our food and drink, likewise effects the due and timely evacuation of what is secreted. It is an object of the first consequence, that nothing remain in the body, which ought to be evacuated ; and that nothing be ejected, which may be of use to its preservation.

How many persons do we find complaining of bad health, notwithstanding every attention they pay to the air they breathe, to aliment, exercise, sleep, &c. ; while others enjoy a good state of health, though totally careless with regard to these particulars. Indeed, much depends on a proper state of the evacuations.—If these be disordered, the most rigorous observance of dietetic rules is insufficient to insure our health ; while, on the contrary, most of those rules may be neglected, for some time, without any injurious consequences, if the evacuations be duly attended to.

Nature removes not only the noxious matter, or such as is in a state of corruption, but likewise the useful fluids, if they become superabundant ; for instance, the milk, the semen, the blood. In such cases, therefore, these must be considered as objects of evacuation, equally natural and salutary.

By *stool*, the thick and feculent remains of assimilated food are evacuated ; for every article of aliment contains more or less dregs, and their smallest particles only can be changed into the milky fluid, or chyle.

By *urine*, we eject the oily and saline particles secreted from the blood, in a diluted state ; which prevents these particles from injuring the external membranes, by their irritating acrimony.

By *insensible perspiration*, which is carried on through the smallest orifices of the pores, the most subtile and noxious particles of the fluids are evaporated ; which, if they were retained within the body, would lay the foundation of its total corruption.

Nature expels all crude and acrid substances by these three principal emunctories ; and accordingly as they are disordered, diseases of different degrees of malignity and duration will necessarily ensue.—Nature also frequently relieves herself by more unusual channels ; such are, the bleeding of the nose in plethoric young men, the hemorrhoids with which persons of a middle age are sometimes troubled, the various ulcers common to those whose fluids are in an impure state, the excretions of saliva, and the expectorations of others, &c.

By a premature suppression of these troublesome but salutary efforts of nature, great mischief may be produced to the individual.

Many persons perspire much under the arms, others in their hands or feet ; others again are subject to eruptions in the face or other parts of the body : such canals, however, if Nature be once accustomed to eject by them certain useless and hurtful particles, cannot be hastily stopped, without occasioning greater and more dangerous inconveniences ; cleanliness, in the strictest sense of the word, is almost the only safe remedy to counteract their fatal effects.

Of Evacuations by Stool.

As the food and drink we consume every day, necessarily deposits useless matter, a daily opening by stool is extremely salutary ; particularly to persons subject to costiveness and the many disagreeable consequences thence arising. Of these I shall only enumerate frequent head-achs, difficult breathing, flatulency, eructations, and spasms : hence peevishness of temper, general lethargy, and at length, hypochondriasis ;—the abdomen of such persons feels tumid ; the circulation of the blood in the intestinal vessels is retarded ; and, consequently, the general circulation interrupted. These complaints, sooner or later, certainly attend habitual costiveness ; especially if no other kind of evacuation, as that by urine, or insensible perspiration, be in an uncommon degree increased.

In healthy individuals, the evacuation by stool usually takes place once or twice a-day ; and, according to the habits of the person, either in the morning or evening. Those who are troubled with costiveness should visit the customary retreat, regularly every morning at a fixed hour, and thus endeavour to promote this necessary evacuation by proper efforts, though they may not, at the moment, feel much inclination ; for it is well founded on experience, that Nature at length will be habituated, by perseverance, to observe a certain regularity in this respect. The most proper time for these attempts is early in the morning, or late in the evening.

Whatever dietetic means may be adopted to promote stool ought to be employed either from three to four hours previous to the time we wish to succeed, or immediately before going to bed. If in the morning, we ought to rise early, to take first a slice of bread with much fresh butter ; then eat some boiled prunes ; drink two or three cups of the decoction ; and, if necessary, assist the operation of the whole with a tea-spoonful or two of cream of tartar in treacle. Thus prepared, we ought to walk a little in the open air, or, if the weather be unfavourable, about the room ; to rub the lower belly with the palm of the hand ; and, when we sit down, to retain the breath, by frequently, though moderately, inspiring ; and, lastly, to change the posture of the body, from a straight to a crooked and sidelong direction, till we succeed in the attempt.

Although these trials should repeatedly fail, we must not be discouraged from persevering in them ; nor ought we, without absolute necessity, to choose any other than the wonted hour to attain the end proposed ; so that this, at length, may become the only time, when Nature shall spontaneously assist our endeavours. During these practices, however, the choice of our diet is of the greatest moment ; as we can powerfully promote the desired end, by living chiefly upon rye bread, spinage, boiled fruit, particularly prunes, decoctions of currants, the sweet and emollient vegetables, especially the beet-root, and occasionally salted meat ; the last of which should be assisted with much drink, not of the spirituous kind, but rather of a mild and aperient nature, such as sweet table-beer, whey, infusions of malt, apples, pears, and the like.

It deserves to be remarked, that if every effort of this kind prove abortive, the voluntary exertions in promoting stool should not be carried to an extravagant degree ; as by such unnatural pressure we may bring on ruptures, the bursting of veins in the rectum, or the piles. Hence it is more adviseable to abstain, for some time, from all crude and solid aliment, and to use only such articles of food and drink as have been before pointed out. And if this also should not be attended with the desired effect, we may then have recourse to the mild purgatives, such as rhubarb, fenna, cream of tartar, and the neutral salts.

While too much rest, and a sedentary life, prevent this species of daily evacuation, gentle

exercise, accompanied with serenity of mind, almost certainly promote it. In many families, costiveness is an habitual and hereditary distemper. Sometimes too it originates from a weakness of the intestinal canal brought on by diseases, but more frequently from the habitual use of certain substances of food and drink; for instance, the lean flesh of quadrupeds, game, the leguminous vegetables, red Port wine, strong and bitter malt liquor, and the like. Hence the pre-disposing cause of the complaint should always be attended to. If it arise from weakness, red wine, bitter ale, and other corroborants, are well calculated to effect a cure. In every instance, frequent exercise in the open air is extremely useful. Persons living sparingly on animal food, and who are otherwise temperate in their passions and desires, are seldom deprived of this natural benefit; and even though they should be without it for two or three days together, they have little to apprehend from such irregularity; for, as they do not wantonly overload their stomach, the accumulation of impurities cannot be considerable.

Where weakness and atony, or laxity of the intestines, are the causes of a costive habit, the external use of cold water, by affusion on the lower belly or merely washing it with that fluid, is frequently preferable to all other dietetic remedies. This is one of the most simple means of preventing painful costiveness; though it ought not to be applied indiscriminately, and least of all in those cases where

the use of the cold bath is improper and hurtful.—If debility and relaxation of the intestinal canal be the cause of costiveness, clysters of cold water alone are generally productive of singular benefit; yet these also cannot be used without many exceptions—not, for instance, by females, during the menses, by persons afflicted with the piles, or having weak lungs, nor in certain kinds of colics and spasms.

The discharges by stool ought to be neither in too liquid nor too dry a state. Strong labour, heating drinks, and long fasting, render them disagreeably hard, even in the healthiest individuals; from the feces remaining too long in the region of the lacteals, so that the nutritious or milky part of the concocted mass is exhausted to the last drop, and there remains behind no other but dry, excrementitious matter. These stools, therefore, are frequently a symptom of good digestion, such as attends sound constitutions in general.

Too dry excrements, in the form of balls, especially in delicate individuals, occasion head-ach, inflammation of the eyes, febrile complaints, hemorrhoids, ruptures, paralytic affections, and frequently produce flatulency and spasms, in persons subject to hysterics and hypochondriasis: nay, even the suppression of flatulency is extremely dangerous. Those who are apt to delay going to stool, expose themselves to many serious inconveniences. When this sensation is lost, it does not usually return for some time. The feces collected in the intestinal canal powerfully distend it, give rise to the blind hemorrhoids, and sometimes even

to a falling down of the anus ; the excrements become dry, and their re-absorbed fluid parts irritate and vitiate the blood, and produce many obstinate distempers. If a person has been costive for several days, the inclination to go to stool is sometimes lost, until restored by artificial means.

Loose and too frequent stools are common with those, who take more aliment than their stomach can digest ; for the food, from the stimulus occasioned by its corruption in the alimentary canal, is too soon ejected, without being duly assimilated. Hence debilitated persons, who eat immoderately, generally are thinner and less muscular than others, who observe a regular and temperate diet. The stools are a tolerable criterion of the quantity and quality of the food we have taken, and whether the digestive powers be adequate to its concoction. For, in weak intestines, the unassimilated matter of food turns acrid, and contributes nothing to the nourishment of the body. Thus it happens, that debilitated individuals, and such as are of a phlegmatic habit, continue lean and emaciated, whatever quantity of food they consume. For this reason, they ought to live principally on milk, eggs, broths, tender meat, emollient vegetables ; and to eat only when they feel a true appetite, and after moderate exercise.—It is not the man who takes comparatively little food, that can be called temperate ; but rather that person who makes use of no more aliment, than he is able to digest. Thin and copious stools, therefore, are a certain proof of indigestion.

Some persons are accustomed to go to stool more than once a-day, others only every second day, and yet enjoy a good state of health. It is, however, more desirable and wholesome to have a regular evacuation every day; and children especially ought to have two or three discharges daily. Aged persons, in general, have but one stool in a day. The air we breathe, makes, in this respect, a remarkable difference. The more we perspire in summer, the fewer are the evacuations; and, on the contrary, moderate exercise is productive of more regular excretions, than that which is too violent. Robust and muscular individuals perspire more than the weak and enervated; hence the evacuations of the former, by other emunctories, are more limited; while the latter, whose fluids are not duly determined to the surface of the body, have more frequent openings by stool.

Obstructions and costiveness, of which many persons now complain, are owing to a variety of causes, but chiefly to our luxurious mode of living, and to the custom of making too many meals through the day. The time requisite to the digestion of a meal cannot be well ascertained, as some stomachs concoct quickly, and others slowly; and there is a remarkable difference in the degrees of digestibility, among the various species of food; the nature and properties of which have been already pointed out in the fifth Chapter. But this may serve as a general rule, that we ought never to take a new supply of food, till the preceding meal be digested.

Some moderate livers, after having deviated from their usual temperance, do not feel any inconvenience till after two or three days, when they are troubled with copious evacuations, head-ach, uneasiness and dejection of mind. Such excesses are frequently accompanied with serious consequences, of which costiveness is only the forerunner. Neither the emetics, or laxatives, to which the glutton has recourse, nor the fashionable stimulants and strengthening bitters, can prevent or remedy the ultimate effects of such brutal habits. The emetics and purgatives inevitably weaken the first passages, and lay the foundation of constant obstipations; while the stimulants deprive the intestines still more of the necessary humours, and render the evil much greater. The most proper means of preventing these hurtful consequences, are the following:

1. A due degree of bodily exercise, by which the muscular power will be invigorated, the nervous system strengthened, and the circulation of the blood promoted.

2. We ought to take a proportionate quantity of drink to our victuals; a circumstance not always sufficiently attended to, by persons of a sedentary life. Drink dilutes the food, and softens the bowels. A weak, well-fermented, and well hopped beer, is an excellent beverage: so is water with the addition of a little wine. Warm diluents, on the contrary, have a manifest tendency to increase obstructions, by the relaxation they produce in the intestines.

3. Let us choose the quality of our food, according to our constitutional wants. Those who cannot digest well, ought to avoid all thick, mealy dishes, pastry, onions, warm and new bread, and such as is not thoroughly baked. Costive persons frequently complain of an acid generated in their stomach; while others, on account of this acid, are subject to loose and very frequent stools. Vinegar and tart wines are but rarely the cause of this acidity; never, indeed, except when they disagree with the stomach. New wines on the contrary, as well as vegetables of an acescent kind, and particularly long kept and roasted fat meat, have the strongest tendency to produce acidity, the heart-burn, and, at length, obstructions in some constitutions, and diarrhœas in others. The proper species of food, in such cases, are herbs, carrots, sugar-peas, french-beans, parsley-roots, the scor-cenera, artichokes, horse-radish, mustard-leaves, and similar plants, boiled soft in broth, sufficiently salted, and without the addition of fat, or butter. Besides these, only a small quantity of meat ought to be used, and this should be tender; but no fat fish, nor game kept too long, for the purpose of rendering it mellow; and lastly, all kinds of fruit ought to be eaten boiled rather than raw.

4. We should not too much indulge in sleep, which, particularly after dinner, is hurtful to persons whose digestion is languid, and whose evacuations are preternaturally slow. During sleep, all the motions in the system are performed with less vigour, and more tardily:

and, in this respect, to keep awake may be considered as a species of exercise; as the nerves, in that state, are more active, and the circulation of the blood is carried on with greater energy.—Evacuations by stool can be suppressed, by sleeping an improper length of time, for instance, ten or twelve hours instead of seven or eight; and we may prevent these salutary discharges, by sitting down to any inactive employment, previous to the usual inclination to retire to stool.

If it be our wish to preserve health, we ought not only to guard against costiveness, but likewise to prevent, by all proper means, too frequent excretions. Copious evacuations of this kind exsiccate the body, and deprive it of that strength, which is necessary to support its exertions. Persons subject to diarrhœa, cannot be too cautious in the use of watery, saline, and easily fermentable articles of food and drink, and in avoiding violent fits of anger and other passions. On the contrary, they will promote their health, by using provisions of a drying nature, drinking a well-fermented, bitter beer or ale, or, if they can afford it, good old wine:—all of which have the beneficial tendency to promote perspiration, and thus prevent superfluous humidity in the body.

If too copious evacuations proceed from a relaxed state of the intestines, daily exercise is of considerable efficacy; for the fibres of the whole body are thereby invigorated; and, if irritating or peccant humours should be the cause of the complaint, nothing is better cal-

culated to expel them by perspiration, urine, or stool, than spirited and persevering muscular motion, until the body be tolerably fatigued. But, in this case, we must not attempt to remove or suppress this material stimulus by astringent remedies ; for, instead of evacuating the noxious matter by the proper emunctories, such medicines will necessarily produce dangerous, and often fatal diseases.

It would be a desirable object; in houses which are not provided with water-closets, that every individual were furnished with his own night-chair ; as most of the common places of retirement are literally ventilators, where some parts of the body are exposed to a current of air, which is frequently the cause of disorders, particularly in persons subject to colds, and all other complaints originating from suppressed perspiration; accidents, which may injure still more those, whose lungs are unsound. Men who are troubled with the piles, and, above all, women during the menses, ought to be very cautious in resorting to such places.—In the usual privies, there generally prevails in summer a pestilential fœtor ; so that it becomes almost impossible to wait for the proper evacuation, both because of the disagreeable smell, and the danger of being infected with disease.

After every stool, there is a slight bearing down of the anus ; a circumstance which renders some precaution in the cleaning of it necessary. The substance used for that purpose ought to be previously examined, whether its surface contain any rough and loose particles,

which would be immediately communicated to the anus, and might gradually produce the blind hemorrhoids.--Lastly, all unnatural forcing and straining of costive persons, is not only useless, but may also be attended with dangerous consequences. It is, therefore, more advisable to use all proper means of keeping, if possible, this important excretion in due regularity ; and, to attain that desirable end, it is further necessary to abandon all strait garments, especially laced stays, and tight waitbands.

Of Urine.

IN a state of health, this discharge takes place oftener than once in a day. The urine of those who live moderately, and take proper exercise, if examined in the morning after rising, and after having spent a quiet and comfortable night, is thin, clear, of a straw colour or inclining to yellow, with a white, loose, and uniform sediment rising in the middle ; it makes no foam, but what immediately vanishes, and has no unusually disagreeable smell. If it correspond to this description, it is a symptom of good digestion, and of the body being free from impurities. The quantity of this evacuation, in healthy persons, depends on their constitution, the season and the weather. It is less in warm than in cold climates, on account of the increased perspiration. In win-

ter, we generally eject more urine than in summer ; and this nearly in proportion to the degree of insensible exudation. In spring and autumn, it is probably voided in an equal proportion.

We may judge (not prognosticate) respecting the state of the body, from the appearance of the urine in the morning only ; for, during the day, this would be a fallacious criterion, from the nature and quantity of food and drink we consume. The ancients were extremely fond of predicting the different states of health and disease in the human body, from the appearances observed in the urine. Among the moderns, who are better acquainted with the animal economy, these appearances are not implicitly attended to, as they have frequently been found to mislead the observer ; yet, the early morning urine, if allowed to stand for an hour or two, exhibits some phenomena, which render it an object worthy the attention of the medical practitioner. Thus, a thin, pale urine, which is voided by the hypochondriac, the hysteric, and persons afflicted with spasms in the abdomen, indicates great weakness, or the approach of cramps, originating from a contraction of the smaller secretory organs. It is likewise of a whitish colour, after taking much weak drink. In debilitated individuals, the urine is foamy, and this froth remains on the top for a considerable time ; because it abounds in tough and viscid particles. The health of such persons, however promising in appearance, is by no means permanently established.

The urine is of a red colour, after too little drink, or after drinking spirituous liquors, after violent exercise, profuse perspiration, and after having spent a restless night. It yields a sediment resembling brick-dust, when the stomach is impure, and the tongue white with a yellowish taint, and covered with viscous matter. According to the higher or paler colour of the urine, in an ordinary state of health, the body may be considered as being more or less vigorous. If, after long standing, no sediment be deposited in it, great weakness is indicated : yet the conclusion is more favourable, although the urine be thick and sandy, if a cloud be observed swimming in the middle.

Indeed it is less dangerous to suppress the evacuations by stool, than those by urine; for, if this remain too long in the bladder, it becomes acrid and corrosive. If the inclination to make water is accompanied with a discharge of a few drops only, it is called a *strangury*; if the difficulty of voiding it is attended with pain, a *dysuria*; and, if a total suppression of it takes place, it is then called an *ischuria*. These diseases are frequently the effects of some malt-liquors, or of certain articles of food, particularly vegetables containing much acidity. In the beginning of such painful complaints, relief can be given by fomenting the patient, about the genitals, with flannel-cloths, as hot as he can bear them, by keeping him sufficiently warm, and allowing him plenty of warm, diluent drink.

Although the quantity of the urine to be voided through the day cannot be accurately

ascertained, yet this evacuation ought always to be proportionate to the drink we have taken, and to the greater or less degree of perspiration. If we perceive a deficiency in this discharge, we ought to take moderate exercise, to drink light, thin, and acidulated diluents, and to eat a variety of such herbs and fruits, as possess diuretic virtues: of this nature are, parsley, asparagus, celery, juniperberries, strawberries, cherries, and the like. We should be careful, not to retain the urine too long; a practice which would occasion relaxation and palsy of the bladder, and which might at length produce the gravel or stone.

Many maladies may arise from voiding too small a quantity of urine; hence the necessity of attending to this excretion, from which we may frequently discover the cause of the disease. The relative state of vigour or debility in the individual, the mode of life, more or less drink, dry or damp weather—all produce a difference in the quantity of this evacuation. Robust persons eject less urine than the debilitated: a copious emission of it is always a symptom of a relaxed body, which is not possessed of sufficient energy to expel its noxious particles by transpiration through the cutaneous vessels.

The more exercise we take, the less we lose by the urinary passages; since they are drained by the pores. Cold and moist air checks perspiration, but promotes the excretion by urine. When this canal is suppressed, the bladder sometimes becomes so much distended that it bursts, as may easily happen to parturi-

ent women ; and hence arise incurable *fistulæ* ; or, if the passages be obstructed, the urine retreats into the cellular texture of the whole body, and penetrates even into the cranium. Women, however, are able to retain it longer than men.—Too copious an evacuation of urine constitutes a peculiar disease, known by the name of *diabetes*, which not unfrequently proves fatal to the sufferer, after he has discharged several gallons a day, for a considerable length of time.

Among the rules and cautions for the proper management of this evacuation, it deserves to be remarked, that it is hurtful to make water too often, or before a proper quantity of it be accumulated in the bladder. By such practice, this vessel gradually contracts into a narrower compass than is assigned by nature, and cannot again be easily distended. Too long a retention of urine, on the contrary, preternaturally enlarges the bladder, weakens its muscular power, and may, with the advancement of age, occasion *ischuria* or a total suppression ; besides which it promotes the deposition of mucus and sand in the bladder, and inevitably leads to that troublesome and painful complaint, the stone.

Of insensible Perspiration.

Of all the natural evacuations, none is so important and extensive, none is carried on with less interruption, and none frees the

body from so many impurities, particularly from acrid and thin humours, as insensible perspiration. The health of man chiefly depends on the proper state of this function: the irregularities occurring in it, occasionally produce peevishness of temper, head-ach, disturbed sleep, heaviness in the limbs, &c. ; and, on the contrary, we find ourselves most lively and vigorous, when it is duly and uniformly performed.

A person of a middle stature, and in perfect health, perspires, according to the calculation of some, from three to four pounds weight, according to others, about five pounds, within twenty-four hours. The exudation by the pores is most essential during the night; the noxious particles only being then separated; which, on account of the disturbances we are exposed to through the day, cannot be so well effected, as the circulation of the blood is thereby interrupted, while at night it is comparatively more calm and regular;—besides which, the nocturnal perspiration is more copious, from the greater uniformity of the surrounding atmosphere.

Most of the febrile diseases arise from a suppressed perspiration; as the exuded matter is of an acrid and irritating nature. To transpire beneficially, means, that the impure and pernicious particles only be ejected, in which case the perspiration is invisible and imperceptible. This is so essential a requisite, that without it the health of the individual cannot long subsist. The reciprocal connection between the functions of the stomach, and of perspiration, is

so obvious, that if the latter be checked, the former is immediately affected; and the reverse takes place, if the stomach be disordered.

The more vigorously a person perspires, (it ought to be well remarked, that the question here is not of *sweating*) the more active are the powers of the body, in the regular concoction of the alimentary juices; and the more certain it is, that no fluids will superabound: for the fluids though refined and subtile, far exceed in weight the more compact and solid parts of the system, so that they would oppress the machine like a heavy burden, if not evacuated by the pores of the skin. Most individuals, however, are accustomed to direct their attention only to evacuations of a more gross nature, or such as are more obvious to the senses. But *insensible* perspiration is of greater moment than all the other excretions; and by paying due regard to that function, if it should be accidentally disturbed, we may frequently discover the lurking cause of a distemper, and remove it, before it has materially injured the body.

Yet, even in the most healthy, this perspiration is not at all times, nor at all hours of the day, equally active. It is weaker after a plentiful meal, but as soon as the food is digested, we again perspire with increased energy; for the new chyle being changed into blood, imparts additional efficacy to the vital powers, as well as to the circulation of the blood itself. As we perspire considerably more in summer than in winter, our mode of life, with respect to sleep, as well as to food and drink, ought to be regulated

accordingly. We know from accurate observation, that if we retire to bed immediately after supper, the process of perspiration is checked in a remarkable degree: we also know, that it is highly conducive to health, that this important function of the body be preserved in the most uniform state; hence it necessarily follows, that, after supper, we ought to sit up at least two hours; and to afford this benefit both to the organs of digestion and perspiration, our suppers should not be delayed to the late hours now so absurdly in fashion.

According to the experiments made by different inquirers into the nature of insensible perspiration, this process is most forcibly affected, and sometimes totally suppressed, by the following circumstances:

1. By violent pain, which in a remarkable degree consumes the fluids of the body, or propels them to other parts.

2. By obstructions of the cutaneous vessels, which are frequently occasioned by the use of salves, ointments, and cosmetics.

3. By severe colds, particularly those contracted at night, and during sleep.

4. When nature is employed with other objects. Thus perspiration is weaker during the time of concoction, particularly after using food difficult of digestion. This is likewise the case, when nature endeavours to promote any other species of evacuation, which more engages the attention of the senses; for instance, vomiting, diarrhoeas, considerable hemorrhages, and the like: farther, when the efforts of Nature are too weak; hence the

aged, the debilitated, and poor persons, unable to supply the wants of the body, or to pay due attention to cleanliness, perspire less than others : lastly, the same must happen to individuals of a sedentary life, who neglect the necessary exercise of the body ; and those likewise who wear too tight garments, and improper ligatures about the joints.

Perspiration, on the contrary, is promoted :

1. By stretching or expanding the limbs ; as, by such means, the lungs and muscles acquire an additional impulse, and the fluids circulating too slowly in the smaller vessels, are propelled to the larger veins and arteries, and thus forwarded to the heart ; so that this principal muscle is then impelled to extend and contract its ventricles with greater force, and consequently to quicken the whole circulation of the blood.

2. By the lukewarm bath, which is well calculated to soften the skin, and thus to open the pores for a better perspiration.

3. By moderate bodily exercise.

4. By mild sudorific remedies ;—and for this reason it is extremely proper, in case of a recent cold, to drink two or three cups of tea, especially previous to going to bed.

If perspirable matter collect in drops, it *should* then be called *Sweat*, and is no longer a natural and necessary evacuation ; on the contrary, we find very healthful and robust persons who seldom or never sweat. By means of this exudation, both noxious and useful particles are at the same time ejected from the surface ; the body is enfeebled ; the blood is

rendered impure ; and the secretion of bad humours is prevented by every violent effort of the cutaneous vessels.

If sweating be carried to excess, it is extremely noxious, and may even be productive of consumption. By insensible perspiration, on the contrary, the superfluous particles only are expelled ; because the circulation of the fluids is slower, and more calm and uniform. This important purification of the blood ought never to be checked : if, therefore, we wish to take a bracing exercise, it should by no means be continued till profuse perspiration take place.

Cold then only checks perspiration, when it occasions an unusual stimulus on the skin, and if we too suddenly remove from a warm to a cold atmosphere. Hence the necessity of accustoming ourselves, from early youth, to the vicissitudes of heat and cold, of walking every day in the open air, and of washing the whole body, at least once a week, with lukewarm, or still better, with cold water. By this practice the pores are braced, and inured to undergo the different changes of the weather and seasons, without suffering (as most people now do, upon the slightest occasion) by severe cold and catarrhs.

It is never too late to begin this strengthening process, by frequently washing and rubbing the whole surface of the body with cold water ; for, if cautiously managed at first, it cannot fail to invigorate young persons and adults, as well as the aged.—To sleep on feather-beds occasions a constant vapour-bath at

night, which again destroys the beneficial acquisitions of the day.—To remove from a cold temperature to a still colder one, is not nearly so prejudicial, as to exchange suddenly the air of a warm room, for that of a moist and cold atmosphere. This accounts for the frequent colds caught in summer, even by going from the burning rays of the sun to the cooling shade ; and hence too the first cold of autumn is most sensibly felt, because we are then unaccustomed to that impression.

Much also, as has been before observed, depends on the nature and properties of our food and drink, in respect to the state of insensible perspiration. The subtile and rarefied fluids only, not those of a coarse and oily consistence, can pervade the skin. Too many oleaginous, viscous, and crude articles of nourishment, such as fat meat, pastry, boiled mealy dishes, smoked hams, sausages, &c. have a strong tendency to obstruct the free perspiration of the body, and consequently to affect the serenity of the mind.

All the depressing passions and emotions are a powerful check to insensible perspiration ; while, on the contrary, those of an exhilarating nature may promote and increase it to such a degree, as sometimes to prove the pre-disposing, though distant cause of consumptions. Moderate daily exercise is eminently calculated to support this function, and to strengthen the whole body. Cleanliness produces a similar effect ; for some impurities continually settle on the surface of the body ; and these, if not removed in time, clog the pores, and are

so detrimental to health, that they may occasion many obstinate distempers, which might be easily prevented, or at least checked in their progress, by a proper and constant attention to the skin.

Too violent a perspiration indicates great debility of the body, or a laxity of the cutaneous vessels, which may frequently be removed by cold bathing or washing. When persons are troubled with unusual night-sweats, they may receive benefit (if it be not a symptom of hectic fever) by taking, immediately before going to bed, two or three drachms of cream of tartar, in either beer or water. But if this simple remedy, after repeated trials, should prove ineffectual, a professional man ought to be consulted; as long-continued night-sweats may in the end produce great weakness, and even consumption.

In most of the common colds, the popular stimulant remedies, such as heating liquors, and particularly sudorifics, are ill calculated to relieve the complaint. If the patient, at the same time, be troubled with pain in the bowels, head-ach, a foul tongue, &c. a gentle laxative will be of greater service than the diaphoretics. But if the stomach be peculiarly affected, if the tongue be clean and the appetite good; two or three cups of warm diluent drink, a tepid bath of the legs, a moderately warm room and dress, gentle exercise, and friction of the skin with warm cloths, are the most proper and generally effectual means of relief.

As the retention of useless and superfluous matter is hurtful, it is not less detrimental to

health, if substances not ready to be evacuated are ejected from the body.—Of this kind are bleedings from the nose, the mouth, and the vessels of the anus : though these are not natural evacuations, yet they may occasionally be beneficial, as Nature sometimes makes an effort to expel noxious matter in an unusual manner. But these parts or fluids ejected as pernicious, strictly speaking, ought not to exist in the body ; and though the evacuation of them be beneficial, it is a symptom of disease. If, therefore, such preternatural discharges take place too violently or frequently, they ought to be checked with judgment and circumspection ; and we should endeavour to lead (but not to force) Nature to a more salutary canal, than that she has chosen, either by accident or wanton compulsion.

Of the Saliva.

THE saliva should not be confounded with mucus, or slime ; the former is a fluid, not intended by Nature to be evacuated, as it serves the important purpose of mixing and preparing the food for the stomach ; hence it ought not to be unnecessarily wasted by frequent spitting ; the latter, mucus, may be safely thrown out as burdensome and offensive. The absurd custom of smoking tobacco is extremely prejudicial, as it weakens the organs of digestion, deprives the body of many useful fluids, and

has a direct tendency to emaciation, particularly in young persons, and those of lean and dry fibres. To these it is the more detrimental, that it promotes not only the spitting of saliva, but likewise other evacuations. This plant is possessed of narcotic properties, by which it produces in those who first begin to smoke it, giddiness, cold sweats, vomiting, purging, and, from its stimulus on the salival glands, a copious flow of the saliva.

Frequent and much smoking makes the teeth yellow and black ; the clay pipes are apt to canker the teeth to such a degree as to infect the breath, and produce putrid ulcers in the gums. Delicate persons especially suffer from this nauseous habit ; as it has a direct tendency, not only to exsiccate their bodies, by contaminating the fluids, rendering them acrid, and vitiating the digestion and assimilation of food, but likewise to impair the mental faculties. These effects, however, are less to be apprehended from smoking tobacco, if it has become habitual, and is not carried to excess. To persons of a middle age, or those of full growth, particularly the corpulent, the phlegmatic, and such as are subject to catarrhal complaints, it may occasionally be of service, if used with moderation, especially in damp, cold, and hazy weather. Yet such persons ought never to smoke immediately before or after a meal, as the saliva is materially requisite to assist the concoction of food, which is not accomplished till about three or four hours after a meal ;—they should smoke slowly ; frequently drink small draughts of beer, ale, tea, or any other

diluent liquors, but neither spirits nor wine ; and, lastly, they should use a clean pipe with a long tube ; for the oil of tobacco, settling on the sides of the pipe, is one of the most acrimonious and hurtful substances, and may thus be accidentally absorbed, and mixed with the fluids of the body.

Of the Mucus of the Nose.

THE secretion of this humour is intended by Nature to protect the olfactory nerves : hence every artificial mean of increasing that secretion is preposterous, unless required by some particular indisposition of the body. The remarks, then, made with respect to the saliva and smoking, are also applicable to the mucus of the nose, and the habit of taking snuff. The question here is not of that catarrhal secretion of viscid slime, which is ejected as useless. Snuff stimulates the mucous membrane of the nose, and, sympathetically, the whole body ; by which the mental powers are in a degree affected. If used as a medicine* only,

* By the persuasion of some friends, who were anxious to see the farcical performance of an empiric, whose name does not deserve to be recorded here, I this day (September 25th, 1798) joined a party, to witness the pretended effects of a certain *snuff powder*, together with what he calls his *aromatic belts*, which are at best but a clumsy imitation of *Wissenschaft's Animal Magnetism* ; (vid. page 113 Vol. I.) and, as such, have not even the merit of originality. The medicated snuff appears to be an assistant mean contrived by this *Charlatan*, to stupify the heads of his patients, who were generally of the lowest class. The German adventurer stood in need of no external remedies to affect the nerves of the *Parisian* fanatics,

and on occasions that require such a stimulus, it may be productive of some advantage ; but a liquid sternutatory deserves every preference to a powder, which, though at first stimulating and occasioning a flow of viscous matter, in the end always obstructs the nostrils. And if this stimulus be too violent, it may bring on so profuse a discharge of matter from the delicate membrane lining the nose, as to relax and corrode it, and to produce a *polypus*, or a concretion of clotted blood in the nostrils.

In several diseases of the head, eyes, and ears, however, the taking of snuff may occasionally supply the place of an artificial issue ; though an extravagant use of it will most certainly produce a contrary effect ; namely, accumulation of matter in the head, bleeding of the nose, and other complaints. Farther, it would be extremely injudicious to advise the use of snuff to persons of a phthisical constitution, or those afflicted with internal ulcers, and subject to spitting of blood ; as, by the violent sneezing it at first occasions, such individuals might expose themselves to imminent danger. —Public speakers of every kind, as well as teachers of languages, and, in short, all those

while our *London Mountebank* cannot, without some additional stimulus, operate on *English* brains. —All this is characteristic of the vile and despicable plans adopted by quacks ; but, to hear an ignorant pretender to medicine decanting on the virtues existing in his aromatic belts ; maintaining that an universal magnetic spirit pervades them ; that this spirit alone cures all the diseases incident to the human frame, even broken limbs and exfoliations of bones ; and, lastly, to permit an audacious impostor to impeach the honesty of the whole Faculty, before a deluded audience — such outrage loudly calls for the interference of the civil magistrate.

to whom a clear and distinct articulation is of consequence, ought to avoid this habit, which, when carried to excess, is, in this respect, extremely prejudicial. Those, too, who have a regard for cleanliness will not accustom themselves to this hurtful practice. In short, the continual use of snuff gradually vitiates the organs of smell ; weakens the faculty of sight, by withdrawing the humours from the eyes ; impairs the sense of hearing ; renders breathing difficult ; depraves the palate ; and, if taken too copiously, falls into the stomach, and in a high degree, injures the organs of digestion.

Besides the many bad effects already mentioned, taking snuff may be attended with another consequence, equally dangerous to the alimentary canal. While the nose is continually obstructed, and a free respiration is impeded, the habitual snuff-taker generally breathes through the mouth only ; he is always obliged to keep his mouth partly open, and consequently to inspire more frequently and with greater efforts. Thus, by inhaling too much air, he probably lays the foundation of that troublesome flatulency, which is common among those hypochondriacs who habitually take snuff. Hence every person, unless good reasons can be assigned in favour of it, ought to be seriously dissuaded from the use of snuff, as well as of tobacco : and it deserves to be remarked, that both these practices may be safely, and cannot be too suddenly relinquished, as soon as reason prevails over sensual gratifications.

Of Wax in the Ears.

IF the ears be seldom, or not properly cleaned, there sometimes accumulates a species of wax, which grows tough and hard, diminishes the acuteness of hearing, obstructs the passage to the ear, and may at length produce total deafness. Copious ear-wax, if it become thin and acrid, may occasion pain, and sometimes a running or suppuration in the ears. Daily washing with cold water strengthens these organs, and is an excellent preservative of the sense of hearing.—If it be apprehended, that insects have made their way into the cavity of the ear, it may be useful to introduce some sweet oil into the orifice, and to repose on that side, the ear of which is the seat of the complaint.

Hemorrhages.

THESE are fluxes of blood, salutary to both sexes, when required and regulated by Nature; but, if suppressed, they may be productive of serious and fatal consequences. The *menstrues* are irregular in their appearance and disappearance; being much influenced by climate, and the constitution of the body: the *hemorrhoids*, on the contrary, originate from the mode of living, joined to a particular temperament of the individual. *Bleeding of the nose* arises either from a superabundance of blood,

and its impetuous circulation, or from the bursting of one of the small arteries.—As long as these fluxes continue within proper limits, and do not exhaust the strength of the person subject to them, there is not the least necessity to employ any artificial means of suppressing them; because Nature must not be rudely checked in her beneficent efforts. Nay, even the affections and passions of the mind ought to be duly regulated, particularly by females of an irritable temper, during the recurrence of the menses; for these may, according to circumstances, be either preternaturally increased, or totally suppressed, to the great injury of health.

Lastly, it is extremely imprudent for young women to expose their feet and legs to dangerous colds, in washing the floors of rooms and passages upon their knees, at a time when they ought particularly to guard against the access of damp and cold. Humane and sensible persons would not require their servants to follow this prejudicial practice, by which they are liable to contract the most obstinate disorders: it produces obstructions in the abdomen, swelling of the legs, dropical complaints, palsy, and even consumptions;—hence the multitude of female servants continually taking refuge in the different hospitals.

Of the retention of Milk.

NOT less hurtful than the suppression of hemorrhages, is the retention of the milk in

the female breast. This, likewise, is generally occasioned by indulging in fits of passion, or by exposing the body, and particularly the lower extremities, to the influence of damp and cold places, or wearing wet clothes, and linen not properly aired. Hence may arise nodules, or small lumps in the breasts, troublesome swellings, especially if the milk be abundant, inflammations accompanied with excruciating pain and violent fever, ulcers in one or more parts of the body at the same time, or scirrhus callosities ; and, at length, if neglected or mismanaged, cancer itself. In many instances, a premature stoppage of the milk, in lying-in women, has produced inflammation of the womb, and a severe child-bed fever. Lastly, imprudence with regard to food and drink, dress, air, &c. may occasion the suppression of the milk, as well as of every other evacuation.

Q

CHAP. IX.

Of the SEXUAL INTERCOURSE ; its physical consequences with respect to the Constitution of the Individual ;—under what circumstances it may be either conducive or hurtful to Health.

A SUBJECT of such extensive importance, both to our physical and moral welfare, as the consequences resulting from either a too limited or extravagant intercourse between the sexes, deserves the strictest inquiry, and the most serious attention of the philosopher.

The inclination to this intercourse, and the evacuation connected with it, are no less inherent in nature, than other bodily functions. Yet, as the semen is the most subtile and spirituous part of the human frame, and as it serves to the support of the nerves, this evacuation is by no means absolutely necessary ; and it is besides attended with circumstances not common to any other. The emission of semen enfeebles the body more than the loss of twenty times the same quantity of blood, more than violent cathartics, emetics, &c. : hence excesses of this nature produce a debilitating effect on the whole nervous system, on both body and mind.

It is founded on the observations of the ablest physiologists, that the greatest part of this refined fluid is re-absorbed, and mixed with the blood, of which it constitutes the most rarefied

and volatile part ; and that it imparts to the body peculiar sprightliness, vivacity, and vigour. These beneficial effects cannot be expected, if the semen be wantonly and improvidently wasted. Besides, the emission of it is accompanied with a peculiar species of tension and convulsion of the whole frame, which is always succeeded by relaxation. For the same reason, even libidinous thoughts, without any loss of semen, are debilitating, though in a less degree, by occasioning a propulsion of the blood to the genitals.

If this evacuation, however, be promoted only in a state of superfluity, and within proper bounds, it is not detrimental to health. Nature, indeed, spontaneously effects it, in the most healthy individuals, during sleep ; and, as long as we observe no difference in bodily and mental energy after such losses, there is no danger to be apprehended from them. It is well established, and attested by the experience of eminent physicians, that in certain indispositions, both of men and women, this is the only permanent remedy that can be advised, to restore their languishing health. It is not uncommon to find, that melancholy, incurable by any other means, has been happily removed, in persons of both sexes, by exchanging a single state for that of wedlock.

There are a variety of circumstances, by which either the utility or the insalubrity of the sexual intercourse is, in general, to be determined.—It is conducive to the well-being of the individual, if Nature (not an extrava-

gant or disordered imagination) induces us to satisfy this inclination, especially under the following conditions :

1. In young persons, that is, adults, or those of a middle age ; as, from the flexibility of their vessels, the strength of their muscles, and the abundance of their vital spirits, they can the better sustain the loss occasioned by this indulgence.

2. In robust persons, who lose no more than is almost immediately replaced.

3. In sprightly individuals, and such as are particularly addicted to pleasure ; for, the stronger the natural desire, the safer is its gratification.

4. In persons who are accustomed to it ;—for Nature pursues a different path, accordingly as she is habituated to the re-absorption, or to the evacuation of this fluid.

5. With a beloved object ; as the power animating the nerves and muscular fibres is in proportion to the pleasure received.

6. After a sound sleep ; because then the body is more energetic ; is provided with a new stock of vital spirits ; and the fluids are duly prepared :—hence the early morning appears to be designed by Nature for the exercise of this function ; as the body is then most vigorous ; and, being unemployed in any other pursuit, its natural propensity to this is the greater : besides, at this time, a few hours sleep can be readily obtained, by which the expended powers are, in a great measure, renovated.

7. With an empty stomach ; for the office of digestion, so material to the restoration of bodily strength, is then uninterrupted. Lastly,

8. In the vernal months ; as Nature, at this season in particular, incites all the lower animals to sexual intercourse ; as we are then most vigorous and sprightly ; and as the spring is not only the safest, but likewise the best time, with respect to the consequences resulting from that intercourse. It is well ascertained by experience, that children begotten in spring are of more solid fibres, and consequently more vigorous and robust, than those generated in the heat of summer, or cold of winter.

It may be collected from the following circumstances, whether or not the gratification of the sexual impulse has been conducive to the well-being of the body ; namely, if it be not succeeded by a peculiar lassitude ; if the body do not feel heavy, and the mind averse to reflection : all which are favourable symptoms, indicating that the various powers have sustained no essential loss, and that superfluous matter only has been evacuated.

Farther, the healthy appearance of the urine, in this case, as well as cheerfulness and vivacity of mind, also prove a proper coction of the fluids, and sufficiently evince an unimpaired state of the animal functions, a due perspiration, and a free circulation of the blood.

There are, however, many cases in which this gratification is the more detrimental to health, when it has been immoderate, and without the impulse of Nature, but particularly in the following situations :

1. In all debilitated persons ; as they do not possess sufficient vital spirits ; and their vigour, after this enervating emission, is consequently much exhausted. Their digestion necessarily suffers, perspiration is checked, and the body becomes languid and heavy.

2. In the aged, whose vital heat is diminished, whose frame is enfeebled by the most moderate enjoyment, and whose strength, already reduced, suffers a still greater diminution, from every loss, that is accompanied with a violent convulsion of the whole body.

3. In persons not arrived at the age of maturity :—by an early intercourse with the other sex, they become enervated and emaciated, and inevitably shorten their lives.

4. In dry, choleric, and thin persons : these, even at a mature age, should seldom indulge in this passion, as their bodies are already in want of moisture and pliability, both of which are much diminished by the sexual intercourse, while the bile is violently agitated, to the great injury of the whole animal frame.—Lean persons generally are of a hot temperament ; and the more heat there is in the body, the greater will be the subsequent dryness. Hence, likewise, to persons in a state of intoxication, this intercourse is extremely pernicious ; because in such a state the increased circulation of the blood towards the head, may be attended with dangerous consequences, such as bursting of blood-vessels, apoplexy, &c. ;—the plethoric are particularly exposed to these dangers.

5. Immediately after meals ; as the powers requisite to the digestion of food are thus diverted, consequently the aliment remains too long unassimilated, and becomes burdensome to the stomach.

6. After violent exercise ; in which case it is still more hurtful than in the preceding, where muscular strength was not consumed, but only required to the aid of another function. After bodily fatigue, on the contrary, the necessary energy is in a manner exhausted, so that every additional exertion of the body must be peculiarly injurious.

7. In the heat of summer, it is less to be indulged in than in spring and autumn ; because the process of concoction and assimilation is effected less vigorously in summer than in the other seasons, and consequently the losses sustained are not so easily recovered. For a similar reason, the sexual commerce is more debilitating, and the capacity for it sooner extinguished, in hot than in temperate climates. The same remark is applicable to every warm temperature combined with moisture, which is extremely apt to debilitate the solid parts. Hence hatters, dyers, bakers, brewers, and all those exposed to steam, generally have relaxed fibres.

8. In a posture of body, which requires great muscular exertion, it is comparatively more enfeebling ; as, in this case, various powers are exhausted at once.

It is an unfavourable symptom, if the rest after this intercourse be uneasy ; which plainly indicates, that more has been 'lost, than

could be repaired by sleep: but if, at the same time, it be productive of relaxation, so as to affect the insensible perspiration, it is a still stronger proof that it has been detrimental to the constitution.—There are, as has been before observed, two principal causes, from which the indulgence in this passion has a debilitating effect on the constitution, particularly in men:—1. by the convulsive motion of the whole frame, combined with the impassioned ecstasy of the mind; and, 2. by the loss of this essential fluid, more than by any other circumstance. But, if it be not emitted, the subsequent relaxation is inconsiderable, and not much increased even on the following day, if the semen should be ejected, upon a repetition of the intercourse.—It certainly is ill-founded, that swellings of the scrotum may arise from a stagnation of the seminal fluid: such swellings, if they really take place, are not attended with any danger; as experience informs us, that they are either again absorbed, to the benefit of the body, or if the accumulation of the semen become too copious, it is spontaneously evacuated by Nature.

The relaxation of those who keep within the bounds of moderation, in this respect, does not continue long; one hour's sleep is generally sufficient to restore their energy. Such temperance is highly beneficial to the whole body, while it serves to animate all its powers, and to promote insensible perspiration, as well as the circulation of the blood. The semen can be emitted without injuring the body, if Nature alone demand it, that is,

when the reservoirs are full, and a material stimulus occasions it, without the active concurrence of imagination.

As it is principally this fluid which affords vivacity, muscular strength, and energy to the animal machine, the frequent loss of it cannot but weaken the nerves, the stomach, the intestines, the eyes, the heart, the brain—in short, the whole body, together with the mental faculties; it in a manner destroys the ardour for every thing great and beautiful, and surrenders the voluptuary, in the prime of his life, to all the terrors and infirmities of a premature old age, from which even the conjugal state cannot save him. The most certain consequence of excess in venery is hypochondriasis, frequently accompanied with incurable melancholy: the unhappy victim endeavours to exhilarate himself by a repetition of these convulsive exertions of his vital spirits, and thus precipitates himself into still greater misery.—Many of the diseases of the eyes originate from such intemperance; and these votaries of pleasure are not unfrequently attacked with *tubercles dorsalis*, or consumption of the back, which generally proves fatal.

Here likewise, every individual ought to pay proper regard to his constitution. Some are provided by Nature with an uncommon portion of bodily vigour, while others are but sparingly supplied: the former, therefore, overcome slight transgressions of this kind, without much danger, while the latter cannot commit excesses with impunity. The natural instinct ought always to be consulted, in what-

ever relates to this function; but it should not, as is frequently the case, be confounded with the artificial stimulus. Hypochondriacs; indeed, as well as those who make use of many nourishing species of food and drink, are sometimes stimulated merely by a certain acrimony in the abdominal vessels; such a stimulus, however, is totally unconnected with the impulse of Nature.

Frequent and copious emissions, during sleep, are productive of equally bad effects; they bring on the frailties of age at an early period of life, and soon prepare the exhausted sufferer for the grave. But infinitely more dangerous is the secret vice of Onanism, which debilitates the body more than any other species of debauchery. By this execrable practice, a greater quantity of semen is evacuated, than by the natural commerce between the sexes; the vital spirits cannot operate so uniformly, as to counterbalance the convulsive effects which agitate the whole animal frame; and the circumstances, which render this hateful vice so destructive to both sexes, particularly at a tender age, are, that the opportunities of committing it are more frequent than those of the sexual intercourse, and that it but too often becomes habitual.

The imagination which, by the natural union of the sexes, is in a certain degree gratified, becomes with every repetition of Onanism more disordered, and is continually filled with libidinous images: and although the frequent loss of semen, is, for a considerable time, supplied, by a fluid of an inferior quality, yet,

even by this imperfect supply, the body is drained of the spirituous and most valuable parts of its fluids.

All kinds of evacuation, when immoderate, are prejudicial to health ; but that of the semen is particularly so ; for it is an established fact, that every stimulus increases the secretion of humours, and that Nature is necessarily forced to make irregular efforts, to restore the losses sustained, in the most speedy, though in its consequences, the most ruinous manner.

As most female animals refuse to receive the males, while they are in a state of pregnancy, the connection with pregnant women appears to be physically improper. Although the dangerous consequences thence arising, both to the mother and child, may have been exaggerated, yet the embrace of women far advanced in pregnancy is certainly not conformable to the laws of Nature, and ought not to be considered as a matter of indifference. Such females as wantonly submit to it may readily miscarry ; for the fetus is thus much compressed, and an additional flow of humours is thereby occasioned. If, however, in married life, this intercourse, notwithstanding its impropriety, should be indulged in, it ought to be practised with precaution, and not too frequently ; as such excesses may not only enfeeble the mother, but likewise be attended with effects very hurtful to the child. Nay, it is asserted by some authors, that the frequent cases of *hydrocephalus*, or dropsy in the head, are to be ascribed chiefly to this practice

among parents ;—a conclusion which, though hypothetical, is not unreasonable.

A connection with females suckling children, is not less improper ; as the milk is thereby vitiated, and the health of the infant affected.—Nor is it justifiable to gratify this passion during the menses ; which may be either thus suddenly suppressed, or, by the increased access of the fluids, may terminate in an hemorrhage of the womb : besides which, the sexual intercourse during this period, as well as for some days immediately preceding, cannot answer the purpose of generation ; because the ovum of the female, being but slightly attached, is again separated by the periodical discharge. Hence the congress of the sexes is most generally crowned with fertility, after the catamenia have ceased ; for then the female is in the most proper state for fecundation, because that the ovum has sufficient time to be consolidated, before the next menstrual evacuation.

Not with a view to satisfy idle curiosity, but for the information of the judicious reader, I shall give some particulars, relative to the nature of the feminal fluid. The semen in men, as it is emitted, consists of various compound humours. Besides the real semen prepared in the scrotum, and deposited in the proper vesicles, it is mixed with the peculiar moisture contained in the latter, with the liquor secreted by the prostate gland, and probably also with some mucus or phlegm from the urethra. It is of a greyish colour, inclining to white, is glutinous and tough,

has a very volatile, penetrating smell, and is of considerable specific gravity. In water, the thicker part, which in all probability is the pure semen, sinks to the bottom; another part appears in fine threads, and forms a thin pellicle on the surface of the water. In persons not arrived at the age of maturity, and likewise in enervated adults, it is of a thin and ferous consistence.

In the fresh semen of those who are capable of procreating, we find a great number of animalculæ, which can be perceived only by means of the most powerful microscopes: these do not appear to be mere vesicles filled with air; as they are formed irregularly, one extremity being somewhat spherical, the other smaller and rather pointed; their supposed use will be mentioned towards the conclusion of this chapter, when treating on the different theories of generation.

As part of the small artery, through which the blood is propelled into both testicles, runs immediately under the skin, and consequently the blood is conducted from a warmer to a much colder place; as the seminal tubes in the testicles are very delicate and long, and take throughout a serpentine course—the canal traversing the upper testicle (*epididymis*) being alone thirty feet long and upwards; as, lastly, the narrow seminal tubes pass over into the wider canal of the epididymis, and this again into the still wider seminal passage: it is obvious, that the secretion and evacuation of the semen not only takes place very slowly, but also in very small quantities.

Nature seems to employ a considerable time in preparing and perfecting a fluid, which is indispensably necessary to the propagation of the species. The quantity, therefore, which is emitted in every intercourse between the sexes, and which is computed to be equal to half an ounce weight,* can be but gradually replaced. Hence it happens, that even men of strong constitutions cannot indulge in venery more than once in three or four days, for any considerable time, without impairing their health, and diminishing their strength. These remarks, however, apply chiefly, and almost exclusively, to the male sex; for, with regard to women, it is an erroneous notion, that they secrete any semen;—what has formerly been considered as such, consists merely of a pituitous liquor, proceeding from the womb and the vagina.

To return from this short digression, I shall farther observe, that, where it may be otherwise proper, it is an excellent and healthful rule, (however ludicrous it may appear to the sensualist) to gratify the inclination for the sexual commerce only at regular stated periods, so that nature may become habituated to it, without making unusual and hurtful efforts. This might be attended with the additional advantage, that persons, in a conjugal state, would not be so apt to commit excesses, which, in the end, are productive of satiety

* This assertion, as the following immediately following, rest upon the authority of Prof. Boerhaave of Janæ; and I here refer to his excellent work: "*Prælectiones de Anatomia et Physiologia, &c.*" (in German,) p. 411 fecunditas, &c. *Humanæ*, 1773.

and indifference towards the object of former affection, and which are undoubtedly the frequent cause of a feeble and degenerate offspring.

No irregularities whatever are more certainly punished than those of venery; and, though the consequences should not immediately take place, they unavoidably follow, and generally at a time when they are most severely felt; sometimes in the organs of generation alone, and sometimes over the whole body. Even the connection with the most beloved object, the possession of whom has been long and anxiously wished for, does not exempt the voluptuary from these prejudicial effects, if the bounds of moderation be exceeded: the imagination at length becomes disordered; the head is filled with libidinous images; and the predominating idea of sensual enjoyment excludes the reflections of reason. Thus Nature becomes in a manner forced to conduct the fluids to the parts of generation, so that such unfortunate persons cannot relinquish this destructive habit; they are troubled with involuntary emissions of the semen, which are extremely debilitating, and which either deprive them entirely of the faculty of procreating, or destroy the elasticity of the parts, and exhaust the semen to such a degree, as to produce only feeble and enervated children.

In those who lead a life of debauchery, spasmodic affections, and even ruptures, are not uncommon: women are afflicted with the *fluor albus*, violent fluxes of the menses, bearing down of the vagina, and innumerable oth-

er maladies of a disagreeable nature. These destructive effects on the body are at first manifested by a general relaxation of the solids: the whole nervous system is reduced to a state of extreme debility, which is seldom, if ever, removed by the most rigorous adherence to diet, and the most apposite medical remedies. Hence necessarily arise, as has been already observed, the almost infinite varieties of hypochondriasis, and imbecility, to so alarming a degree, that persons of this description cannot direct their attention to one object, for a quarter of an hour together: their spirits are exhausted; their memory as well as their judgment are greatly impaired; and in short, all the faculties of mind, all its serenity and tranquillity, are so much affected, that they scarcely enjoy one happy moment.

The external senses do not suffer less upon these occasions: the eyes, especially, become weaker, imaginary figures are continually floating before them, and frequently the power of vision is entirely destroyed.—The stomach also, on account of its intimate connection with the nerves, in a great measure partakes of these infirmities: whence arise diseases of various degrees of malignity;—the lungs too become disordered; hence the many lingering and incurable consumptions, which destroy such numbers in the prime of life. If, however, they survive the baneful effects of their intemperance, their bodies become bent from absolute weakness, their gait sluggish and tottering, and the residue of their days is marked with painful debility.

Young persons, as well as those whose employments require much muscular exertion, are in an uncommon degree weakened by frequent debauches. Indeed, the sexual intercourse, even within the limits of moderation, is more hurtful to some individuals than to others. Thus, a person born of strong and healthy parents is not nearly so much hurt by occasional extravagance as another, whose parents were weak and enervated, or who is himself threatened with consumption; and, lastly, those also ought to be abstemious in this respect, who feel an unusual lassitude and weakness, after the least indulgence.

There are people who, from ignorance, have long been in the habit of committing excesses, and who wish at once to reform their mode of life; the consequence of this sudden change generally is an increased debility; and they become very liable to fits of the gout, hysteric and hypochondriacal complaints. As they are sensible of their growing weakness, they expect to relieve themselves by strengthening remedies, which render their situation still worse, being apt to occasion involuntary emissions of semen in the night, to relax and destroy the stomach, and at length to produce an irritating acrimony in the intestines, which is the frequent cause of such emissions. Even the mild corroborants cannot be used here with any hopes of success; as the body is overloaded with pituitous phlegm, from which readily arise jaundice and dropsy. Hence it is more advisable, and, at least in a physical respect,

more salutary, to return from such irregularities by gradual steps, than by a too sudden and dangerous change.

It is further remarkable, that most persons, especially in the higher ranks, do not marry at a proper period of life ; partly from caprice and family-considerations ; partly on account of the difficulty to maintain a family, in the present more expensive mode of living ; and partly from other causes which are best known to bachelors. Thus they enter into the conjugal state, when their frame is enervated by dissipation of every kind ; but such debauchees ought not to be permitted by the State to encumber the world with a degenerate offspring.

On the contrary, to be married too early, and before a person has attained the age of maturity, is likewise improper and hurtful. Every candidate for matrimony should endeavour to obtain the most accurate intelligence, whether the object of his affection be qualified for the various duties of that state, or whether she be subject to phthifical, hysterical, and nervous complaints, all of which ought to be guarded against ; as, besides the misfortune of being united to a valetudinary partner, healthy women only will produce sound and vigorous children.

Those who do not marry for the sake of wealth and family-interest, should choose a well formed and agreeable partner, as deformed mothers seldom bring forth handsome children. The natural disposition of a woman likewise, deserves to be investigated, previous to the union ; for it is the opinion of accurate

observers, that children most generally inherit the propensities and passions of the mother. There ought to be no remarkable difference between the age of the married couple; and the most proper time in life for matrimony, in our climate in general, appears to be that between the age of eighteen and twenty in the female, and from twenty-two to twenty-four in the male sex.

Lastly, women who are hump-backed, or who have had the rickets in their infancy, ought not to enter the state of wedlock; the former, in particular, (according to the rules of sound state-policy) should by no means be allowed to marry, until examined by professional persons, whether there be any impediment to child-bearing from the preternatural structure of the *pelvis*:—this frequently renders the Cæsarean operation necessary; or the artificial separation of the pelvis is connected with imminent danger of life. For the same reason, even elderly women should not be encouraged to engage in matrimony, as they either remain barren, or, if not, they experience very difficult and painful parturition.

In some rare instances, however, too great abstinence may be the cause of serious distempers. A total retention of the semen is not indeed always hurtful; but it may be so, occasionally, to persons naturally lascivious, and to those of a corpulent habit. These are generally provided with an abundance of the seminal fluid, which, if too long retained in the body, causes involuntary evacuations, plethora, swelling, pain and inflammation of the semi-

nal vessels, the inspissation and at length corruption of the stagnating semen—and sometimes priapisms, convulsions, melancholy, and at length furious lewdness.

The female sex are not less liable to diseases from inevitable abstinence : loss of strength, *chlorosis*, *fluor albus*, hysterics, and even *furor uterinus*, may sometimes be the consequence. Yet, I cannot upon this occasion omit to remark, that these effects seldom, if ever, take place in those who live regularly, and do not encourage libidinous ideas ; and that both males and females would undoubtedly derive greater benefit from total continence, till marriage, than by an unlimited indulgence in venery : in the former case, they would not only in a great measure contribute to their vigour of body and mind, but also to the prolongation of life.—Young women of an habitually pale colour, may be justly suspected of being troubled with the *fluor albus* ;—or of having an ardent desire to change their state.

To repair the injuries brought on by an excessive indulgence in the sexual commerce, such means ought to be employed, as are calculated to remove the irregularities which have taken place in the functions of digestion and perspiration, and to give new energy to the solid parts. With this intention, the quantity of food is not of so much consequence as its quality ; hence the diet should be nourishing, of easy digestion, and have a tendency to promote insensible perspiration : in all states of debility, a light and spare diet is the most suitable to restore strength, without exerting too much the

digestive organs. Rich nourishment, therefore, as well as tough, flatulent, and crude victuals, or those which are liable to ferment in the stomach, would, in such cases, be extremely pernicious.—But, above all, a rigid degree of abstinence from the intercourse which has occasioned the weakness, cannot be too seriously recommended ; as this alone is generally sufficient to restore muscular vigour, especially where youth and soundness of constitution are in favour of the individual.

Although we are possessed of no specifics, strictly deserving the appellation of *aphrodisiacs*, yet there certainly are means, which tend to promote the desire, as well as the capacity, of carrying on the sexual intercourse : these are either such as contribute to increase the seminal fluid, or stimulate the genital organs. Of the former kind are those, which afford a rich chyle and salubrious blood, which conduct this fluid more abundantly to the parts of generation, and are on that account mildly diuretic ; for instance, milk, eggs, tender and nourishing meat, herbs and roots of a mild, spicy nature, and such as promote the secretion of urine, moderate bodily exercise, particularly on horse-back, &c. Merely stimulating remedies, however, should not be employed without great precaution, especially by the infirm, and those beyond a certain age ; for the emission of semen, in these, is generally attended with debility and disgust : while in young and robust persons there is no necessity to increase the secretion of that fluid by artificial means.

There are likewise remedies of an opposite tendency, more effectually answering the purpose of moderating, or rather checking a too violent propensity to venery, than those before stated, with a view to promote it. In the present state of society, and particularly among maritime nations, where a great proportion of men and women are obliged to lead a single life, the means conducive to diminish this passion, deserves every attention. Of this nature are :

1. A laborious and rigid life, much bodily exercise, little sleep, and a spare diet ; so that the fluids may be more easily conducted to other parts, and that they may not be produced in a greater quantity, than is requisite to the support of the body. For the same reason, it is advisable, as soon as the desire of committing excesses rises to any height, immediately to resort to some serious avocation, to make use of less nutritious food and drink, to avoid all dishes peculiarly stimulating to the palate, and to abstain from the use of wine, and other spirituous liquors.

2. To shun every species of excitement ; such as intimacy with the other sex, amorous conversations, libidinous narratives, seductive books, pictures, &c.

3. A cool regimen in every respect :—hence Plato and Aristotle recommended the custom of going barefoot, as a means of checking the stimulus to carnal desire ; so that this indecorous practice was considered by the ancients as a symbol of chastity. The cold bath was likewise suggested for the same purpose ;

others again, among whom may be reckoned Pliny and Galen, advised to wear thin sheets of lead on the calves of the legs, and near the kidneys.—With the same intention, and probably with better effect, may be used the cooling species of nourishment, such as lettuce, water-purflane, cucumbers, &c.—for common drink, mere water; and, if the impulse of passion should increase, a small quantity of nitre, vinegar, or vitriolic acid, may occasionally be added to the water, to render it more cooling.—Yet all these and similar remedies are of little or no advantage to the habitual voluptuary, especially if subject to hypochondriasis. The exciting cause in such persons not unfrequently proceeds from a diseased abdomen, which, as has been before observed, may be so much obstructed, that all other remedies are in vain, until the material stimulus of such obstructions be removed.—Lastly,

4. The various *extenuants*, such as spices of all kinds, and the smoking of tobacco, violent exercise, &c. are equally improper; as these would inevitably impair the health of persons naturally lean, sanguine, and choleric; while in cold and phlegmatic temperaments, they would rather tend to increase than to abate the stimulus.

Having now, as far as was consistent with the plan of this work, investigated both the beneficial and detrimental consequences of the sexual intercourse, I propose to conclude this subject with a concise view of the principal *theories of generation*, which have been offered by the ablest physiologists, and which I have

extracted from the afore-mentioned work of Dr. Loder.

“ The origin of the first germ of the embryo, (says the learned Professor) and the manner of its formation, are so obscure, that of all the conjectures made by the most attentive and ingenious observers, none has yet obtained general credit, or arrived at any degree of certainty. The sexual function appears to belong to those secrets of Nature, to the developement of which the powers of the human understanding are altogether inadequate. Yet it is not undeserving the attention of a reflecting mind, to become acquainted with the diversified hypotheses that have prevailed on this subject, and particularly those which have the greatest share of probability in their favour.

“ Some of the ancient naturalists have searched for the first germ of the embryo, not within the bodies of the parents, but absolutely in external objects; while they maintained, that it is introduced from without, either by the air, or particular articles of nourishment; and, if it happen to meet with a body qualified to effect its formation, it then receives life, and grows; but, in the contrary case, it passes away unchanged. This whimsical conjecture is undeservedly transmitted to our times, by the name of *pan spermia*;—it is unworthy of refutation, as it is unfounded, and totally inconsistent with experience.

“ By another hypothesis (*generatio æquivoca*) it was asserted, that a variety of insects, and even of the smaller animals, may originate

from extraneous substances, by mere fermentation and putrefaction, without previous generation, or any intercourse of males and females.—Thus maggots were said to arise from putrifying meat, and in wounds; fleas to grow in urine and feces, &c. But by more accurate observations we have learnt, that such vermin are only generated in putrescible bodies, when the eggs of those insects, which feed upon putrid substances, have been previously deposited in them.—Yet there is a certain kind of minute animals, which seem to receive life merely from the vivifying powers of Nature, being bred, by infusion, in substances foreign to their species; and to these perhaps the preceding theory is so far applicable, as their origin is involved in obscurity.

“Other naturalists have ascribed the first germ of the embryo exclusively to the semen of the male. Hence arose the singular opinion, that the small embryo, with all its parts, is already deposited visibly in the semen; or that it may be produced from this humour by mere fermentation, or chemical process, without the co-operation of the animal body. Hence also the hypothesis formerly maintained by several eminent writers, that the animalculæ of the semen are to be considered as germs of embryos; that, with every intercourse between the sexes, an innumerable quantity of these is introduced into the female parts of generation; that only one or two of such animalculæ arrive at the ovaria, from thence return to the womb, and progressively grow there; but that all the

others necessarily perish.*—This bold conjecture is not only incompatible with the wisdom of the Creator, but, besides other strong arguments against it, in a manner refutes itself by this circumstance, that in very different creatures, for instance, in men and in asses, there are found animalculæ exactly similar, while in animals of the greatest resemblance in other respects, we meet with animalculæ altogether different. For this reason, they ought to be considered as little creatures inherent in the animal body, and which indeed may form an essential part of a fruitful semen, but the use of which is yet unknown.

“ Another sect of natural philosophers, who attributed to both sexes an equal share in the procreating function, maintained, that the germ of the embryo originates in a mixture of the male and female semen, the latter of which proceeds from the ovaria. Among later naturalists, the celebrated BUFFON was the principal supporter of this opinion. He endeavoured to establish this hypothetical notion, by conjoining with it the idea of certain *internal forms*, which were requisite to the formation of the parts of the body; in consequence of which he maintained, that the sex of the em-

* *Ludwig von Hammon*, a young man, born at Dantzic, during the time of his studying medicine at Leyden, and in the course of his microscopical pursuits, discovered, in the month of August, 1677, in a drop of the semen of a cock recently dissected, a kind of ocean, in which swam thousands of little, lively, active animals. The same phenomenon was also observed in the mature semen of other male animals; and in these animalculæ were immediately thought to be seen the germs of subsequent perfect animals. By this discovery, a key was supposed to be found, which would unlock the whole mystery of generation.

bryo is determined by the circumstance of its consisting of a greater quantity of male or female semen.—But, as the supposed female semen does not proceed from the ovaria, and as the ovaria are not connected with the womb by any tubes, but merely by solid ligaments, it follows that women seern no semen, and what is improperly so called, is only, as I have already observed, a pituitous liquor secreted from the uterus and the vagina. It is farther inconceivable, that the embryo could be endowed with corporeal parts, different from those of father and mother, if it originated merely in the mixture of the seminal fluids of both, and if these should comprehend all the individual parts of the body. Besides, the fanciful internal forms of Buffon cannot be proved by any argument or observation.

“ Again, others have ascribed the germ of the embryo to the mother alone, while they granted to the male semen no other power than that of vivification. These philosophers, among whom we find HALLER and BONNET, seriously asserted, that the whole body of the embryo lies already prepared in the ovary of the mother, so that it requires only to be developed, and that the male semen communicates merely the first impulse to this development. They certainly went too far in this assertion ; yet it is highly probable, that the crude matter already exists in the ovary, and that it is first animated by the semen of the male, and thus qualified for its gradual formation.

“Respecting the manner in which the embryo is formed, there prevail two principal theories, namely, that of *evolution*,* and that

* “According to this theory, (says the facetious *Prof* BRUMENBACH, of *Göttingen*,) we, and indeed all the children of Adam, were at one time, *isso facto*, pent up in the two ovaria of our common mother, Eve. There we lay, as it were, asleep; and though astonishingly little creatures, yet completely organized bodies and perfect miniatures of the forms we have since attained; for, says HALLER, “*All our viscera, and the bones themselves were then already formed, although in a kind of fluid state.*” That which we call impregnation, is nothing else than the action of awakening the germ from its lethargic state, by means of the male semen, which stimulates the little creature’s heart to the first pulsation; and so on.

“The same kind of idea has lately induced a very celebrated naturalist of Geneva, and a warm advocate of this theory, to plan out for us a history of organized bodies previous to the state of impregnation; from which we learn, 1. that we are all much older than we suppose ourselves to be: 2. that all mankind are exactly of the same age, the great-grandfather being not a second older than the youngest of his great-grandchildren; 3. that this respectable age of ours may be about six thousand years. The same natural historian also entirely agrees in opinion with Bazin; that since this charming long series of years, when we were all packed together, along with Cain and Abel, and the other two hundred thousand millions of men, which, according to the best calculations, have since that period gone—*quo pius Æneas, quo Tullus divex, et Ancus*; in a word, since the first creation, during which time we have been in a kind of lethargic sleep, though not entirely motionless; that during the whole fifty-seven centuries, I say, previous to our being awakened by the above-mentioned stimulus, we were, according to Bazin’s opinion, always growing by imperceptible degrees; for instance, we were most probably rather a little bigger at the time we lay beside Cain’s nieces, than when all their uncles and aunts were of the party, as it is very natural to suppose, that we must then have been considerably more straitened for room. In this manner, our apartment became gradually more easy and commodious, in proportion as our forefathers were evolved; and we kept continually expanding ourselves more and more, until the succession of evolution at last came to our turn! !”

Such is the ludicrous account of a theory which, though leading to the most extravagant and romantic conclusions, was supported by the great Baron HALLER, and the late Italian philosopher, SPALLANZANI. These eminent men have endeavoured to support the doctrine of the pre-existence of complete organized *molecula* in the ovaria of females before impregnation, by many experiments and observations, which at first sight, appeared to be

of *gradual formation* (*epigenesis*.) Agreeably to the former, it was conjectured, that all organic bodies, which have already originated, or which may at any future time originate from one another, have been combined, or inclosed one within another as germs, from the first creation of the world; and that they required only a gradual evolution, to bring them to a state of perfection. The supporters of this theory alleged the instance of the vine-fretter, which evidently contains in itself several generations, as likewise that of the butterfly, which lies already formed in its case, and various other plausible examples; but, above all, they endeavoured to explain their hypothesis by the origin of the chicken in the egg;*

so far conclusive, that they obtained full and general credit for more than thirty years. Prof. Blumenbach himself not only believed in the truth of this absurd doctrine, but defended it in many of his earlier writings. At length, however, the success he unexpectedly met with, in an experiment with a species of a green-armed polypus (*conserua fontinalis*), and its astonishingly rapid powers of reproduction, induced this candid philosopher to acknowledge his former errors, and to publish an '*Essay on Generation*,' in which he boldly attacks all former theories; attempts to refute them, partly by argument, partly by his peculiarly humorous mode of exposing the inconsistencies they lead to; and, at the same time, proposes a new hypothesis, the substance of which I shall insert in a subsequent page, when the theory of *gradual formation* will be considered.

* To such readers as are desirous to become more fully acquainted with the particulars of this extraordinary conjecture, it may be useful to illustrate it with the following account, extracted from the Essay before quoted, from the pen of Prof. Blumenbach.

"Mr. Paul," says he, "a natural historian of great reputation, has (in his preface to the 8th vol. of the *Collection Academique*, p. 22, & seq.) objected to Haller's demonstration, that, allowing the membranes of the yolk with its invisible vessels to have pre-existed in the hen, yet it is possible that the embryo is only formed during incubation, and that its blood-vessels afterwards unite with

which, however, is a direct demonstration of the contrary. The objections which have been started against this opinion, concerning the

the blood-vessels of the membranes of the yolk, and thus form an *anastomosis*.

“Baron von Haller immediately declared loudly against this objection, and denied it, as a thing altogether *impossible*, that the tender vessels of the microscopic embryo should be capable of anastomosing with the large blood-vessels of the giant yolk.

“But what is rather singular is, that this very ingenious and meritorious author, who denies the possibility of such an anastomosis, supposes without any hesitation, and in the same work, when explaining human conception, that the very minute germ, as soon as it has arrived at the cavity of the uterus, forms an adhesion with it, by means of the placenta;—And how?—Just in the same way that he denies it to the embryo of the hen; that is to say, by an anastomosis taking place between the microscopic and tender branches of the umbilical vessels, and the giant ones of the maternal uterus.

“The modern advocates for the theory of evolution have taken this observation of the yolk of the egg, as the prop of their hypothesis.—Long before this, however, the spawn of the frog had been employed for the same purpose.

“Nearly a century indeed before that period, SWAMMERDAM announced the wonderful discovery, that the black points in the spawn of a frog were so many perfectly-formed little frogs, and that they pre-existed in the ovaria, although not discoverable by the naked eye.

“The good man seemed to have had a *presentiment* of the uncertainty and instability of all vain worldly honours; and he therefore, as is well known, soon after betook himself to a more solid enjoyment, in which Mademoiselle Bourignon participated. And, indeed, it happened as he appears to have foreseen; for the ungrateful world now ascribe the merits of that discovery to the celebrated Abbe SPALLANZANI, who has maintained it in several of his writings, but more particularly in the second volume of his “*Dissertazioni di fisica animale e vegetabile*.” Tom. xi. in Modena, 1780, 8vo.

“He calls the little black points of the fecundated spawn of frogs, tadpoles, or young frogs; and, as this little black point exactly resembles the same in the unfecundated spawn, he reasons agreeably to his logic, that the tadpoles must have existed in the mother.—I do not know what would be thought of a chemist who should assert that the *Arbor Diæa* pre-existed in a mass of amalgam of silver, because, when a weak solution of silver was poured on it, a little tree seemed to spring out of it.—One ought to be ashamed of wasting much time in the refutation of an assertion, of the falsity of which any unprejudiced person, who is not alto-

minuteness of the germs, and the production of monsters, or bodies of preternatural shape, may be easily removed ; but a more weighty objection made against this theory is that which relates to the restoration of parts lost from the body, and which appears to be irrefutable.

gether unaccustomed to observations of the kind, may convince himself, every spring.

“Whoever has taken the trouble accurately to examine the spawn of the frog, must confess, that the idea of demonstrating the little black points it contains to be so many completely formed tadpoles, resembles Brother Peter’s method of reasoning in the *Tale of a Tub*, where he demonstrates to his brothers, that a brown loaf is a piece of excellent roast mutton.—But the abettors of the theory of organized germs have gone a step farther in support of their opinions. They refer to cases where even young girls, in all their maiden chastity, have become pregnant, from the untimely and premature evolution of one of these organized germs.

“The concurrence of facts is sometimes most wonderful. It happened, that in the very same year, in which Swammerdam announced his discovery in the spawn of the frog, a case was published in the *Ephem. rerum nat. curios.* delivered to the society by a celebrated court-physician of those times, Dr. CLAUDIUS, which exactly suited, as a confirmation of Swammerdam’s opinion.—A miller’s wife was delivered of a little girl, whose belly seemed of an unusual size. Eight days afterwards this big-bellied child was seized with such violent pains and restlessness, that every one who was present thought it could not outlive the next instant. The sick infant, however, in the mean time, actually bore a well-formed, elegant, lively little daughter, about the size of one’s middle finger, which was regularly baptized. During the time, and after the birth, the waters, placenta, and other impurities were duly discharged ; but both the little mother and daughter died early on the following day !!!” (Prof. Blumenbach says, in a note subjoined to this account, that he has made use of the very words of a contemporary physician, Dr. OTTO, who was consulted by the grandmother (the miller’s wife) during her pregnancy. His nephew has vindicated and illustrated the whole history in a most learned and ingenious manner : ‘*D. C. J. Aug. Ottonis Epistola de fatu pueri*, 12, *siue de fetu in fatu.*’ Weidmanns, 1740, 8vo.)

“Baron von Haller very judiciously classes this case with another from the Transactions of the Academy of Sciences at Stockholm, where, on dissecting a young girl, bones, teeth, and intestines, were found in a tumour of the mesentery. These two cases he looks upon as principal evidences for the truth of the doctrine of germs pre-existing in the mother.

Besides these considerations, many arguments may be produced to shew the futility of that doctrine.

“ More probable than the former, unquestionably is the theory of *gradual formation* :* according to which it is supposed, that previous to generation there exists no real germ, but crude matter only, from which the parts of the organic body are gradually formed. The power by which this formation is accomplished, is a certain formative effort pervading all nature, (*NISUS FORMATIVUS* ; *vis plastica*, *vis essentialis*) manifesting its activity according to equal and determinate laws, although in a dif-

* Another definition of *Epigenesis* deserves to be inserted here, as it is more concise, and as its author, Prof. Blumenbach, has not only embraced this doctrine as the most rational on a subject of so mysterious a nature, but has likewise been at great pains to elucidate the gradual formation of animate bodies by an additional hypothesis—his *nifus formativus* (*Bildungs-trieb*), or the spontaneous effort of Nature in forming homogeneous substances.—“ It is supposed,” says he, “ that the prepared, but at the same time unorganized rudiments of the fœtus, first begin to be gradually organized, when it arrives at its place of destination, at a due time, and under the necessary circumstances. This is the doctrine of *Epigenesis*.” And with a view to corroborate this supposition, the learned Professor makes the following categorical declaration : “ *That there is no such thing in nature, as pre-existing organized germs ; but that the unorganized matter of generation, after being duly prepared, and having arrived at its place of destination, acquires a peculiar action, or nifus, which nifus continues to operate through the whole life of the animal, and that by it the first form of the animal, or plant, is not only determined, but afterwards preserved, and when deranged, is again restored. A nifus, which seems therefore to depend on the powers of life, but which is as distinct from the other qualities of living bodies, (sensitivity, irritability, and contractility,) as from the common properties of dead matter : that it is the chief principle of generation, growth, nutrition, and reproduction ; and that to distinguish it from all others, it may be denominated the FORMATIVE NISUS.*”

I shall only add, that this is, at present, the prevailing theory in the German Universities ; though, in reality, it leaves us as much in the dark as any other.

ferent manner, in the functions of nutrition and generation, as well as in the restoration of parts accidentally lost. It may be safely asserted, that this is a mere modification of the universal power of vitality ; if no obstacle be opposed to this plastic effort, the young organic body then receives its proper form ; but, in the contrary case, there arise various unnatural shapes and monsters. By the influence of climate, aliment, mode of living, and other incidental circumstances, this effort of Nature may, in the course of life, be variously modified ; nay, it is liable to changes in the very first crude matter, or in the plastic lymph, by the different constitution of the male semen.— But the principal arguments in favour of the theory of gradual formation are justly derived from the first origin of plants, from the formation of the chick in the egg, and from the reproduction of such parts of the body as have been lost, either by accident or necessity.

CHAP. X.

Of the AFFECTIONS and PASSIONS of the MIND;—their relative good and bad effects on Health.

THE boundless ocean does not exhibit scenes more diversified, than the various affections and passions of the human mind. They arise partly from the mind itself, and partly from the various constitutions and temperaments of the individual. While no other remedies but rational arguments can influence the mind, the disposition of the body may be changed and improved, by an infinite variety of means.

It is, indeed, principally from bodily causes, that many persons are violently affected from the most insignificant motives, and others are little, if at all, influenced by the most calamitous events. It is, for instance, obviously from a physical cause, that violent medicines, poisons, the bite of mad animals, &c. produce timidity, or fits of anger and rage:—that accumulations of black bile in the abdomen make people reserved, peevish, melancholy, and stupid. What we wish to think, and in what manner to continue the operations of the mind, frequently does not depend upon ourselves. The thoughts of the sober are very different from those of the man in a state of

intoxication. A certain dish, a particular drink, may suspend the powers of reason.

The temperament of man is, as it were, the source of his mental operations. Affections and passions are different one from another in degree only. The former imply the inclination or propensity to a passion ; the latter, the realized affections, whether simple or compound ; or in other words, they constitute an actual and perceptible degree of sensual desire or aversion. According to Lord KAIMES, passions are active and accompanied with desires ; affections are inactive and destitute of passion. He also distinguishes between wishes and desires : the former he calls the highest activity of the affections. Compassion and wishes for the better, are in his idea *affections* : pity, and a desire after what is better, he calls *passions*.

Passions operate upon the body either suddenly, or slowly and gradually. Sudden death, or imminent danger of life, may be the consequence of the former : a gradual decline and consumption, that of the latter. The passions, as such, may be aptly divided into two principal classes, those of an agreeable and of a disagreeable nature. Men of strong imagination chiefly suffer from passions of the violent kind, while those of more understanding, and less fancy, are subject to slow emotions of the mind. Indolent persons, whose sensations are dull, and less passionate, than those who combine acute feelings, and a lively imagination, with a clear understanding. The greatest minds are generally the most impassioned.

All passions, of whatever kind, if they rise to a high and violent degree, are of a dangerous tendency ; bodily disease, nay death itself, may be their concomitant effects. Fatal apoplexies have frequently followed sudden dread or terror. Catalepsy and epileptic fits sometimes accompany immoderate affliction, or distressing anxiety. Hypochondriasis, hysterics, and habitual dejection, may indeed arise from a variety of physical causes ; but they are as frequently generated by the passions or sufferings of the mind alone, in individuals otherwise healthy.

Diseases of the mind, after some time, produce various disorders of the body ; as diseases of the body occasionally terminate in imbecility. In either case, the malady must be opposed by physical, as well as moral remedies.

It is only by the management of the constitution and education of the individual, that the passions may be rendered useful ; for, if uncontrolled and left to themselves, they affect us as a tempest does the ocean, without our being able to counteract their pernicious influence. Since all affections whatever consist in desire or aversion, they must necessarily be accompanied with representations of so lively a nature, as to induce the individual to perform the corresponding voluntary motions. Consequently the affections must also be accompanied by *sensible* motions within the body, not only by voluntary actions, but by those also, which contribute to the support of life, and which are more or less violent, according to the degree of the affection. Joy, for instance,

enlivens all the corporeal powers, and, as it were, pervades the whole animal frame. Hope has nearly a similar effect; and these two affections contribute to the preservation of health and life, more than all the medicines that can be contrived. But of the other affections of the mind, we can, in most instances, observe scarcely any other effect, than that of irregular motions, which, not unlike medicines, in a limited degree, and under certain circumstances, may be occasionally useful. *Hence the dominion over our passions and affections is an essential and indispensable requisite to health.* Every individual, indeed, is at his birth provided with a certain basis of inclinations, and with his peculiar moral temperament: the most tender infant, even before he is capable of speaking, discovers by his features and gestures the principal inclinations of his mind. If these be fostered in his susceptible breast, they will grow up with him, and become so habitual, that the adult cannot, without the greatest exertion, overcome them by the power of reason.

The physical state of the body is most happy, when the mind enjoys a moderate degree of gaiety, such as is generally met with in healthy and virtuous persons. The circulation of the fluids and perspiration are then carried on with proper vigour; obstructions are thereby prevented or removed; and by this lively and uniform motion, not only digestion, but likewise all the other functions of the body, are duly performed.

Joy is that state of the mind, in which it feels extraordinary pleasure; in which it enjoys a high degree of contentment and happiness. The activity of the whole machine is enlivened by it; the eyes sparkle; the action of the heart and arteries is increased; the circulation of all the fluids is more vigorous and uniform; it facilitates the cure of diseases in general, and forwards convalescence. The different degrees of this affection are, *Gaiety*, *Cheerfulness*, *Mirth*, *Exultation*, *Rapture*, and *Ecstasy*.—Habitual joy and serenity, arising from the perfection, rectitude, and due subordination of our faculties, and their lively exercise on objects agreeable to them, constitute mental or rational happiness.

Evacuations which are moderate, a proper state of perspiration, and all food of an aperient quality and easy digestion, may be considered as contributing to a joyful state of mind. A pure, dry air, and every thing that invigorates the functions of the body, on the well-being of which the serenity of mind greatly depends, has a tendency to obviate stagnations. Joy farther is more salutary, when combined with other moderate affections: and the various bodily exertions, as well as the employments of the mind, in reflecting upon different objects, are then successfully performed.—A moderate degree of joy removes the noxious particles of the body, and in this respect is equal, nay superior in salubrity, to bodily exercise; but excess and too long duration of this passion attenuate and carry away not only the superfluous, but likewise many useful flu-

ids, and more than the natural functions can restore. Hence, this too violent motion and dissipation of humours is attended with relaxation and heaviness ; and sleep also is prevented, which alone can re-invigorate the nerves, that have suffered from too great tension. On this account, the celebrated SANCTORIUS dissuades persons from gambling, who cannot control their passions ; because of the joy which accompanies their success, being followed by restless nights, and great abstraction of perspirable matter. Sudden and excessive joy may prove extremely hurtful, on account of the great waste of energy, and the lively vibration of the nerves, which is the more noxious after long rest. Nay, it may become dangerous, by causing expansion or laceration of the vessels, spitting of blood, fevers, deprivation of understanding, swooning, and even sudden death. If we have anticipated any joyful event, the body is gradually prepared to undergo the emotions connected with it.—For this reason, we ought to fortify ourselves with the necessary share of firmness, to meet joyful as well as disastrous tidings.

Laughter is sometimes the effect or consequence of joy ; and it frequently arises from a sudden disappointment of the mind, when directed to an object which, instead of being serious and important, terminates unexpectedly in insignificance. Within the bounds of moderation, laughter is a salutary emotion ; for, as a deep inspiration of air takes place, which is succeeded by a short and frequently repeated expiration, the lungs are filled with

a great quantity of blood, and gradually emptied, so that its circulation through the lungs is thus beneficially promoted. It manifests a similar effect on the organs of digestion. Pains in the stomach, colics, and several complaints that could not be relieved by other means, have been frequently removed by this. In many cases, where it is purposely raised, laughter is of excellent service, as a remedy which agitates and enlivens the whole frame. Experience also furnishes us with many remarkable instances, that obstinate ulcers of the lungs and of the liver, which had resisted every effort of medicine, were happily opened and cured by a fit of laughter artificially excited.

Hope is the anticipation of joy, or the presentiment of an expected good. It is attended with all the favourable effects of a fortunate event, without possessing any of its physical disadvantages; because the expectation of happiness does not affect us so excessively as its enjoyment. Besides, it is not liable to those interruptions, from which no human pleasure is exempt; it is employed principally with ideal or imaginary objects, and generally keeps within the bounds of moderation; lastly, the sense of happiness contained in hope far exceeds the satisfaction received from immediate enjoyment, consequently it has a more beneficial influence on health than good fortune realized. Although hope is, in itself, merely ideal, and presents its flattering and embellished images to the fancy in a borrowed light, yet it is, nevertheless, the only genuine source of human happiness. Hope, therefore, is the

most favourable state of mind to health, and has frequently preserved the serenity and prolonged the existence of those, whose situation appeared to be forlorn.

Love, viewed in its most favourable light, presents to us a picture of permanent joy, and is attended with all the good effects of that passion. It enlivens the pulsations of the heart and arteries, promotes the operations of the different functions of the body; and it has frequently been observed, that a strong attachment to a beloved object has cured inveterate disorders, which had resisted all medicinal powers, and which had been considered incurable. The changes which this passion can effect on the powers and the whole disposition of the mind, are equally remarkable. For the extraordinary exertions, made to obtain possession of the object of our wishes, excite a sensation and consciousness of strength, which enables man not only to undertake, but also to perform the greatest achievements. In that exalted state, he sets all difficulties at defiance, and surmounts every obstacle.

Sorrow is the reverse of joy, and operates either suddenly or slowly, according as the cause of it is of greater or less importance and duration. The lowest degree of it is called *Concern*;—when it arises from the disappointment of hopes and endeavours, it is *Vexation*;—when silent and thoughtful it settles into *Pensiveness* or *Sadness*;—when it is long indulged in, so as to prey upon, and possess the mind, it becomes habitual, and grows into

Melancholy.—Sorrow increased and continued, is called *Grief*;—when tossed by hopes and fears, it is *Distraction*;—when all these are drowned by sorrow, it settles into *Despair*.—The highest degrees of sorrow are called *Agonies*.

Sorrow seldom proves suddenly fatal; for, though it injures the nervous energy, it does not hasten the circulation of the blood, with the rapidity of other passions, but rather retards its course. Yet there are examples of its speedy and fatal effects.—Not unlike a slow poison, sorrow corrodes the powers of mind and body; it enfeebles the whole nervous system; the heart beats slower; the circulation of the blood and other fluids becomes more inert; they frequently stagnate in their channels, and generate evils more serious than sadness itself. Farther, the face at first turns pale, then yellow and tumid; the body and mind are worn out; the course of the blood through the lungs must be assisted by frequent sighing; the appetite and digestion become vitiated; and thus arise obstructions, hysteric and hypochondriacal complaints, and, at length, consumption, which is inevitable destruction to the body, frequently in the prime of life, and in spite of the healing art. Persons who indulge themselves in peevishness, very soon lose their appetite, together with the power of digestion; their mouth has a bitter taste; flatulency, colic, spasms, faintings, and the long list of stomachic complaints necessarily follow. Men become subject to the blind hemorrhoids; and women to sup-

pression or other irregularities of the menses, costiveness, or chronic diarrhoea. The bile, on account of the retarded circulation, either grows hard and produces indurations of the liver, or it is mixed with the blood, and generates jaundice or dropsy. Such persons in time become very irritable and peevish; and with the frequent return of grief, the mind, at length, is totally employed in contemplating its wretched situation, so that it finds new food for increasing it in almost every object it beholds. Hence the whole imagination is by degrees obscured, and the most usual consequences of it are, the deepest melancholy—succeeded either by a nervous fever, or insanity—sometimes cancer, and at other times a speedier dissolution, by what is then called *a broken heart*.

Solitude and idleness are not only the remote causes of many passions, but also support and foster them, without exception: they collect and fix the attention of the mind on the favourite objects, and make us reflect the more keenly on the causes of the passions, the less we are interrupted in these fond reveries by other sensations. Though it is certain, that it is not in our power to avert grief, from which even sages and heroes are not always exempt, yet we can do much to alleviate it, by denying ourselves the enjoyment which this indulgence in certain situations affords. Moral arguments of consolation, if properly adapted to the capacity and mental disposition of the sufferer, have in these cases generally a powerful influence. Those whose

minds are affected by sorrow, ought to avoid as much as possible the company of persons, who are fond of relating their calamities, and recounting their misfortunes. On the contrary, whatever has a tendency to cheer the mind, and to divert it from disagreeable objects, ought to be instantly resorted to. Of this nature are, company, business, cheerful music, and the social affections.—The body should be frequently rubbed with dry cloths, perfumed with amber, vinegar, sugar, and the like; the lukewarm bath may be employed with great advantage; and, if circumstances permit, the patient should remove to a warmer and drier climate.—If temperately used, a weak and mild wine is of excellent service, but an immoderate indulgence in wine may disorder the stomach, by the quantity of acid it produces.

Weeping generally accompanies sorrow, if it be not too intense: tears are the anodynes of grief, and ought not to be restrained by adults. We feel in weeping an anxiety and contraction of the breast, which impedes respiration; probably, because then a superfluous quantity of air is contained in the lungs, which is forcibly expelled by sobbing. By this obstruction in breathing, the blood, which ought to be re-conducted from the head, accumulates in the lungs, and consequently in the veins: hence arise redness, heat of the face, and a flow of tears, which are regulated in quantity by the degree of sadness that produced them. Their principal good effects are, their preventing the danger to be apprehended from grief, by diminishing the spasmodic motions in the breast

and head, and by restoring regularity in respiration, as well as in the circulation of the blood : hence persons find themselves much relieved after a plentiful flow of tears, which however are extremely prejudicial to the eyes.

Grief arising from an ungratified desire of returning home and seeing our relations, is productive of a disease very common among the Swiss, and which sometimes, after a short state of melancholy, trembling of the limbs, and other symptoms apparently not very dangerous, hurries the unhappy sufferer to the grave, but more frequently throws him into a consumption, and generates the most singular whims and fancies. Persuasions, punishments, medicines, are here of no service ; but a suddenly revived hope, or gratification of the patient's wishes, have a powerful effect ; provided that an incurable consumption, or insanity, have not already taken place.

There is also a singular hysteric or nervous fever, which affects many unfortunate sufferers in mental disorders, and which was first accurately described by RICHARD MANNINGHAM. Debilitated persons, and those of great sensibility, of both sexes, after melancholy affections and other exhaustions of strength, are particularly subject to this disorder. It begins with irregular paroxysms, and manifests itself by an undefinable indisposition, a dry tongue without thirst, anxiety without a visible cause, want of appetite, a low, quick, and unequal pulse, a pale and copious urine, occasional sensations of cold and shivering, sometimes clammy sweats, sometimes colic, sleeplessness, and

insanity. According to the experience of Manningham, this fever generally terminates, in the course of thirty or forty days, by faintings, silent reveries, and death ; unless it be removed in the beginning, by bracing and strengthening remedies.

Among the mournful passions we may also include an *extravagant degree of love*, or such as transgresses the bounds of reason. It is then no longer a pleasure, but a disquietude of mind, attended with the most irregular emotions ; it disorders the understanding ; gradually consumes all the vital powers, by a slow fever ; prevents nutrition, and reduces the body to a skeleton. All the passions, indeed, may in their more violent degrees occasion a depravation of the understanding ; but sorrow and love are peculiarly calculated to produce so fatal an effect. This mental disorder, to which both sexes, but especially women, are subject, should be opposed in time, by physical as well as moral remedies.—Much may be done here by education, and a proper choice of society. The imagination should be withdrawn from such images, as may encourage inordinate and excessive love ; and it cannot be denied, that young females particularly are frequently precipitated into this weakness, merely by reading improper novels. This imbecility of mind becomes the more dangerous in young people, as it is generally increased by solitude, and their ignorance of the real world.—Exalted ideas of virtue, of magnanimity, and a generous self-denial, are excellent antidotes ; but, if the body sink under

the weight of passion, even these exertions are insufficient to support the energy of the mind. The physical remedies to be resorted to in these situations are, rigid temperance, a frugal and less nourishing diet, constant employment, and much exercise; but the most successful of all, is a happy marriage.

Of all the passions that can aid the medical art, there is none from which we may expect greater benefit, than from a rational gratification of love. On the contrary, a too ardent passion is attended with the most dangerous physical consequences: it is nearly related to disappointed love, and usually shews itself by a reserved melancholy, a general distrust, and a gloomy misanthropy, which, however, externally appears only under the character of lassitude and depression. It is apt to be followed by a suppression of the menses, consumption of the lungs, and even insanity.

Disappointed love is extremely detrimental to health, and gradually destructive to the body; it sometimes produces *furor uterinus* in females of an irascible temper and romantic turn of mind, unless the passion itself be radically cured.

The most dangerous effect of love is *jealousy*;—this pitiable passion, like disappointed love and pride, is very liable to terminate in madness.*—In sanguine temperaments, the excess of this affection is productive of conse-

* In the houses appropriated to the unhappy victims of insanity, we generally meet with three different classes. The first consists of men deprived of their understanding, by pride; the second of girls, by love; and the third of women, by jealousy.

quences most prejudicial to the body; their fluids are impelled to a more rapid circulation, and secrete, with preternatural velocity, that valuable fluid which stimulates them to venery. Such persons are much addicted to ease, pleasure, and every species of gratification, which suits their irritable nerves: their skin and muscles being soft, and accessible to every stimulus, and their fluids thin and rarefied, it may be easily conceived, that their humours circulate with rapidity to the parts of generation, and that their nerves are thus constantly excited to desire. The dreadful consequences are but too frequently visible in young persons, whether single or married, who have too early indulged in such excesses. Hence originate *tabes dorsalis*, wasting of the limbs, spitting of blood, pulmonary consumption, hectic fever, and the whole train of undefinable nervous diseases, so called for want of more proper names; besides a host of other disorders, mostly incurable.

In order to prevent, or at least to oppose, the torrent of these and similar passions, man must not only be seriously apprised and convinced of his danger, and the dreadful misery attendant on intemperance and excess, but he must also submit to a strictly temperate mode of life, if he aspire to rise to the dignity of his nature, and above the rank of the lower animals. He is a rational being, though his sensitive faculties every where remind him of his animal nature. Hence the following rules cannot be too rigidly adhered to: a constant and useful employment; salutary exercise of

the body, till it be moderately fatigued ; temperance in eating and drinking ; abstinence from strong and heating food and liquors ; avoiding the habits of effeminacy, solitude, and too much rest ; and lastly, a strict attention, from early youth, to the most rigid modesty and purity of manners.

Envy arises from self-love or self-interest, particularly in such individuals as have neglected to cultivate their own talents, or to whom Nature has denied certain qualifications of body or mind, which they cannot avoid seeing in others : it is principally excited, when they are witnesses of the prosperity of persons who possess such superior endowments. People of a narrow mind, and those of a confined education, are most subject to this mean passion. Envy deprives those addicted to it of an appetite for food, of sleep, of every enjoyment, and disposes them to febrile complaints ; but in general it is hurtful to those only who brood over and indulge in this corrosive passion. For the world contains vast numbers, who show their envy at almost every event productive of good fortune to others, and who yet often attain a very great age. Joy at the misfortunes, or the discovered foibles of others, self-love, calumny against their neighbours, satire and ridicule, are the never-failing resources of their malignant dispositions. Medicines cannot cure a disease so odious ; education and improvement of morals are its only antidotes. Envious persons commonly give too much importance to trifles : hence they ought to be in-

structed to employ themselves in more useful pursuits; to judge of things according to their true value, and to accustom themselves to a philosophic calmness; they ought to learn how to overcome, or at least to moderate, their selfishness; to counterbalance their expectations with their deserts, and to equal or surpass others, in their merits rather than in their pretensions.

Fear or *anxiety*, is the apprehension of evil. Fear weakens the powers of the mind, relaxes and congeals every part of the human body, retards the pulse, hinders respiration, obstructs the menses, sometimes also perspiration; hence it produces tremor and dread; frequently too it excites perspiration, since it disorganizes every thing linked to the body by means of the nerves. It is apt to occasion diarrhœa, and, in some individuals, an involuntary discharge of semen. Some persons of a relaxed habit are, by great fear, thrown into a perspiration resembling the agonies of death; and others cannot retain their urine. Timorous persons are more readily infected by epidemical disorders than those possessed of courage; because fear not only weakens the energy of the heart, but at the same time promotes the absorption of the skin, so as to render the timid more liable to contagion. In short, fear increases the malignity of diseases; changes their natural course; aggravates them by a thousand incidental circumstances, so that they resist all remedies; and suppresses the efforts of Nature so as to terminate in speedy dissolution. The usual consequences of violent and super-

stitious fear, produced by a disordered imagination, are eruptions in the face, swellings, cutaneous inflammations, and painful ulcers. In some instances, too, fear has produced palsy, loss of speech, epilepsy, and even madness* itself.

Bashfulness is an inferior degree of fear, which retains the blood in the external vessels of the breast, and the whole countenance. Hence, in females of a delicate constitution, and transparent skin, we observe the blush not only overspread the face but also the bosom. If carried to a greater degree, it is attended with dangerous consequences, particularly in the individuals before-mentioned: it may stop the flux of the menses and prove fatal, if an attack of a fever should accelerate the catastrophe.—A very high degree of bashfulness may generate a dangerous fever, even in men; though, from modern education, instances of this latter kind become every day more rare. An extravagant degree of bashfulness closely borders on fear: if it does not proceed from vice or corrupted manners, it may be corrected by social intercourse with persons of a cheerful disposition.

Terror, or the dread of an evil surprising us, before we are able to prevent it, is of all passions the most destructive, and the most difficult to be avoided, because its operation is unforeseen and instantaneous. To shun all occa-

* One instance of this effect I have myself witnessed, in a gentleman, now living in Edinburgh, who was at Lisbon in the awful earthquake of 1755; and who, from the great fright which seized him upon seeing whole streets and churches tumble down before him, has been deprived of his understanding ever since.

sions that may produce it, is perhaps the only remedy. Persons who are feeble and possessed of much sensibility, are most subject to terror, and likewise most affected by it. Its effects are, a sudden and violent contraction of almost every muscle, that serves to perform the voluntary motions. It may farther occasion polypous concretions of the heart, inflammations of the external parts of the body, spasms, and swoons ; at the same time, it may stop salutary evacuations, particularly perspiration and hemorrhages ; it may repel ulcers and cutaneous eruptions, to the great detriment of health, and danger of life. The menses are sometimes instantaneously suppressed : palpitation of the heart, trembling in the limbs, and in a more violent degree, convulsions and epileptic fits, or a general catalepsy, and sudden death itself, are the subsequent effects of terror.

As terror quickly compels the blood to retreat from the skin to the internal parts, it forcibly checks the circulation of all the fluids. If anger accompany terror, there not unfrequently arise violent hemorrhages, vomiting, and apoplexy. Terror has been known suddenly to turn the hair grey.—An inattentive and injudicious mode of educating children often lays the foundation of this infirmity, which is difficult to be eradicated at a more advanced age. Persons under the influence of this passion, should be treated like those who suffer from any other spasmodic contraction. Tea, a little wine, or spirits and water may be given to them ; vinegar, lavender-drops, or spirits of hartshorn, may be held to the nostrils ;

warm bathing of the feet, and emollient injections may be of advantage; and, lastly, the different evacuations ought to be promoted;—but, above all, the mind ought to be duly composed.

Anger arises from a sense or apprehension of suffered injustice, and an impetuous desire of revenge. Its different degrees depend upon the impressions made by the injury, or the ardour of the disposition to vengeance. In the former case, namely, when the sense of injustice is the prevalent feeling, anger affects us like terror, and produces spasmodic contractions and stagnations in the liver and its vessels, sometimes so considerable as to change the bile into a concrete mass; from this cause alone often arise the gravel and stone of the bladder. The more usual consequences of anger, if joined to affliction, are paleness of the face, palpitation of the heart, faltering of the tongue, trembling of the limbs, and jaundice.

If, on the contrary, the hope of revenge be the predominant feature in anger, violent commotions take place in the whole system; the circulation of all the fluids, as well as the pulsations of the heart and arteries, are perceptibly increased; the vital spirits flow rapidly but irregularly, through the limbs; the muscles make uncommon efforts, while some appear almost palsied; the face becomes red; the eyes sparkle; and the whole body feels elated and inclined to motion. This species of anger is by far the most common.

Anger and terror are, therefore, particularly injurious, to the tender bodies of infants,

who are possessed of extreme sensibility, easily affected, and consequently much exposed to these passions, on account of the proportionally greater size of their nerves, and their inability to restrain passion by the influence of reason. They are liable to be so severely affected, that they may die suddenly in convulsions, or retain during life an imbecile body and mind, liable to be terrified upon the slightest occasion. When children are apt to cry in sleep, when they start up and make motions indicating fear or terror, it must not be always ascribed to actual pain, but frequently to dreams; which fill their young minds with terrible images, especially if they have often been frightened while awake. All parents know how much some children are addicted to anger and malice, and how difficult it is to suppress the ebullition of these passions. Hence we ought to beware of giving the most distant encouragement to such destructive emotions. For it is certain, that both men and women of an irascible temper generally die of a consumption of the lungs.

Persons of an irritable disposition are more frequently exposed to anger than others; they are more easily affected by every passion. Hence the tendency to anger is particularly visible in individuals troubled with hysterics and hypochondriasis, as well as in debilitated and disappointed men of letters. Persons of a hot and dry temperament, of strong black hair, and great muscular strength, are likewise much subject to fits of anger.

A moderate degree of this passion is frequently of advantage to phlegmatic, gouty, and hypochondriac individuals, as it excites the nerves to action; but, if too violent and raging, it dissipates the more volatile part of the fluids, and is productive of the most hurtful consequences. In the epileptic, scorbutic, choleric, and such as have open wounds, it causes fever, spitting of blood, convulsions, inflammations, throbbing pains in the side, jaundice, apoplexy, &c.

No fluid is more affected by anger than the bile, which by its violent influx into the *duodenum* produces a fixed spasmodic pain in the region of the navel, flatulency, vomiting, a bitter taste in the mouth, anxiety and pressure about the pit of the stomach, and, at length, either obstructions or diarrhœa.—Wine, or other heating liquors, drank immediately after a fit of anger, and strong exercise or labour, are attended with consequences still more pernicious, as are also emetics, laxatives, and blood-letting.

The propensity to anger is increased by want of sleep, by heating food and drink, bitter substances, much animal food, rich soups, spices, and by all things that have a tendency to inflame the blood. Persons subject to this passion should use diluent, acidulated, and gently aperient drink, and observe in every respect the most rigid temperance. Such persons ought to sleep more than others; and employ the lukewarm bath, gentle cathartics of cream of tartar or tamarinds, fruit, butter-milk, whey, vegetable aliment, &c.

Among other arguments against anger, young people, especially females, should be informed, that besides the physical dangers attendant on this passion, it deforms the face, and, like all the impetuous emotions of the mind, deprives the passionate of every charm, and induces a strong aversion to such companions. Those who feel the approach of anger in their mind, should, as much as possible, divert their attention from the objects of provocation; for instance, by reciting a passage they have learnt by heart; or, as Julius Cæsar did, by repeating the Roman alphabet.

Inward fretting, in which sadness is combined with anger, is the more destructive, that it does not vent itself in words, or external actions. There may arise from it giddiness, inclination to vomiting, sudden pain in the side, great anxiety, and similar complaints. Somewhat related to this infirmity is, what Dr. WEIKARDT, a German author, calls the "*mal de cour*;" a cruel malady, which comprehends anger, avarice, envy, and sadness.—From a sense of neglect and unmerited injury, whether real or imaginary, which torments courtiers, the habitual peevishness of a great proportion of men leads them to avenge their disappointment, by oppressing and ill-treating their dependants. To accustom themselves to consider the physical and moral vicissitudes of life, and the perishable nature of all terrestrial happiness, with becoming firmness, and to enlarge their minds by the acquisition of useful knowledge, are the best remedies for this mental disease.

When sadness or fear have so overpowered the heart and the understanding, that all hopes of averting the apprehended evils are extinguished, the mind sinks into *Despair*. We then see no comfort in futurity, and our ideas of approaching misery become so intolerable, that we think ourselves incapable to sustain it, and seek no other remedy but death. There are attacks of despair, and an inclination to suicide, in which people are, upon any unforeseen event, suddenly deprived of their understanding, and reduced to temporary insanity. This precipitate species of despair more nearly resembles terror. Others are solitary and reserved ; continually brooding over their misfortunes, till at length all their hopes and resolution fail. Their despair, consequently, is more nearly allied to melancholy, than any other passion.

A sudden fit of despair is owing to very irritable muscular fibres, which are quickly excited to the most irregular motions, and from which arises confusion in the senses and the imagination. In profoundly thoughtful and melancholy individuals, the solid parts are weakened, the fluids become thick, heavy, and stagnating ; and this weakness of the solids gives them a sensation of peculiar debility. They are dispirited and dejected ; their stagnating, or, at best, slowly circulating fluids, occasion in them a sense of anxiety and timidity ; whence gloomy representations are but too easily impressed on their mind. This is very apt to be the case with persons who eat more animal than vegetable food, which pro-

duces very rich and substantial blood. From this source some authors derive the choleric disposition of the British in general ; but I have endeavoured to prove, in the fifth Chapter, on Food and Drink, p. 31 and foll. that this observation cannot be maintained on rational principles, and that it is inconsistent with actual experience. It is also said of the Negroes, that they are more subject to melancholy, and even to suicide, because their blood is more compact, florid, and substantial, than that of the Europeans.

The ambitious are likewise frequently seized with this affection, when they meet with any thing to give them offence or obstruct their projects. Prodigals, and those who are strangers to the troubles and difficulties of life, are subject to fits of despair, whenever they are reduced to a state of adversity. Too rigid conceptions of virtue have also, though seldom, been the occasion of this infatuated passion. The cautions and rules for preventing despair and suicide are the same which must be employed to counteract such other passions as depress the suffering mind ; but they must be modified according to the temperament of the individual ; and the cure of such evils ought to be directed principally to the body, and partly also to the mind.

Nothing, indeed, is better adapted to protect us against all the uneasy and turbulent emotions of the mind, than a temperate and active life : as, on the contrary, intemperance unavoidably occasions irregular commotions in the fluids, and may be the source of

disease and imbecility. Hence PYTHAGORAS advised his pupils to abstain from animal food, which excites wrath, with all the other passions and desires. Idleness and want of exercise are not less productive of many malignant propensities.

It cannot be doubted, that those who, at an early, docile age, combine solid principles of virtue with a sober and active life, and who are by frequent examples reminded of the turpitude and disadvantages attending violent passions in others, will of themselves repress these enemies to human life. Yet it is much more difficult to suppress passions that have already made some progress; in which cases censure and rational remonstrances are seldom availing. To those, however, who have not reached such a pitch of obstinacy, as to be above taking advice, the following hints may not be unprofitable :

1. To remove, without delay, the object that gave rise to the passion, or at least to deprive it of its nourishment, so that it may die of itself; by going to some other place, which presents a different scene.

2. One affection frequently assists in subduing another of an opposite nature; such as to inspire the timorous with courage; the angry, with fear; the too violent lover, with hatred, and so forth.—This, however, is seldom practicable.

3. Let us direct our thoughts to other objects of pursuit, such as public amusements, the chase, travelling, agreeable company, or other

favourite employments of an useful and assuasive nature.

4. *Musical*. Nothing is so well calculated to moderate and calm the nerves, to quiet the mind, and to assuage the passions; provided that the hearer possess a musical ear and feeling, and the kind of music be adapted to his particular taste and situation. Hence we cannot be too much on our guard in the choice of music, as certain kinds of it have a tendency rather to increase than to allay the paroxysm of passion.

5. The state of perspiration deserves particular attention. For it is confirmed by numberless experiments, that passions decrease in the same degree as perspiration is increased, particularly if they be of such a nature as to check insensible perspiration; for instance, melancholy, terror, fear, and the like. Indeed, all the different evacuations are beneficial in this case. Lastly,

6. Let us make use of no medicines immediately after a fit of passion. The most advisable regimen consists in temperance in eating and drinking, especially in abstaining from hard, indigestible food, cold drink, and cold air. We should better consult our health, after any such emotions, by keeping ourselves moderately warm, and drinking tea, or some similar beverage.

After a very violent paroxysm of anger it is sometimes necessary to open a vein, in order to prevent inflammation; or to cause the evacuation of the bile by an emetic; which cases, however, are to be determined only

by professional men.—The saliva should not be swallowed in such a situation; for it is supposed to have a slightly poisonous quality. Persons under the influence of terror sometimes stand in need of a cordial; but the melancholy will find in wine and other strong liquors rather an uncertain remedy, or which, at best, is only palliative: and, if immoderately used, they must necessarily promote sadness, as well as every other passion, which these supposed anodynes, in the end, always increase by their alternately stimulating and relaxing effects.

W

CHAP. XI.

Of the different ORGANS OF SENSE, and their respective functions.—Of the supposed Seat and Operation of the Soul—Motion—Muscular Action.

BEFORE we proceed to investigate the peculiar functions of the different senses, it will be useful, if not necessary, to premise a short analysis of *sensation*, or in other words, of the seat and operation of the soul.

The ancients imagined the seat of the soul to be in the stomach, because of the acute feeling of this organ, and the multitude of nerves with which it is provided, and by which it is connected with other parts. But it is now universally admitted by physiologists and anatomists, that the operations of the mind are carried on principally in the brain; that this is the point of union, in which all the nerves meet, and which is to be considered as the assemblage of all sensations, or the *sensorium commune*. The brain is in the most immediate connection with the perceptive faculty; and here all the nerves are as it were concentrated into one point.

Prof. SOEMMERING, of Mayence, has lately endeavoured to prove in a very ingenious publication, that the ventricles of the brain properly contain the more immediate cause of the various operations of the soul; that there is

a fluid, or at least a subtile vapour, secreted from these parts, in consequence of the activity of the mind exercised in the ventricles of the brain; and that all the varieties of intellect, in human beings, depend upon the diversity of the structure of these ventricles, and the various states of vigour and mental energy there exerted.

Without attempting to decide upon a question so remote from human investigation, I may be allowed to observe, that all conjectures respecting the seat of the soul are in reality frivolous and unsatisfactory, until we have ascertained, in what manner the important functions of the brain, which is intimately connected and thoroughly blended with the nerves, are affected within the cranium; whether this be done by vibrations, by secretions of humours or vapours; or by the peculiar manner in which the numerous blood-vessels are disposed in the brain, so as to allow the blood to exert its influence, and to produce all the changes there, by the force and momentum of its own circulation;—all these particulars must be ascertained, before we can form a decisive opinion respecting the situation of the soul.

This much, however, is certain, that one of the principal offices of the nerves consists in communicating to the brain those impressions, which are made on the body by external objects. As soon as, by means of this communication, a certain change takes place in the brain, the mind becomes conscious of it. But every perception must be acquired through

the senses; because the impressions, of whatever kind, must previously strike the organs of sense, before they can be communicated to the nerves.

Although it be established and admitted, that the nerves are the medium of all the operations between body and mind; yet no philosopher has hitherto been able to discover the ultimate chain or link by which they are connected, or the exact point in which they meet. Much, however, depends here upon our idea of the mind. It appears, from the contradictory opinions which, from time to time, have prevailed on this interesting subject, that the inquirers have been too much in the habit of evading the materiality of the soul; and yet they assigned it a certain place of residence in the body, which to this day is imagined to be in either one or other part of the brain. I conceive the soul to be the primary animating power and the maximum of all powers in the animal body. And why should we hesitate to consider matter (of the *primary* properties of which we are but little informed) as perfectly simple and yet extremely operative?

The mind, then, is probably not confined to any particular part of the body, neither exclusively to the brain, to the stomach, nor to the blood; but distributed through the whole system, always one and the same power, save that it is sometimes more, sometimes less concentrated; and, if I may be permitted to say so, it is a pure, elementary, ethereal agent. In the *brain* it displays its principal energies: here are seated consciousness, the capacity of

thinking and judging, memory, and all the higher faculties of the mind. But again, it must be observed, that different parts of the brain seem to contain different faculties; so that memory, probably, occupies more the external crust, and the power of thinking, the interior substance of the brain.

With respect to memory, it is remarkable, that nervous and epileptic patients are usually deprived of that faculty, before any other of their mental powers are impaired. Perhaps the efficient cause of the disease has not penetrated the brain deep enough, so as to affect the seat of the understanding and judgment; till at length, with the progress of the disease, the higher powers of the mind become affected.

Even the lower faculties, the emotions of the mind, and the various passions, appear to be situated in different organs. Thus, the seat of terror and anger seems to be in the stomach, and in the biliary system; the more amiable feelings, as philanthropy, compassion, hope, love, &c. seem to be situated in the heart; fear and surprise, in the external surface of the head and back; and sudden pain, in the breast.

The next question arises, how are these powers put in motion? Has the assemblage of these faculties, or the *sensorium commune*, an original and independent capacity of receiving ideas; of forming new ones from its own materials; of being conscious of these internal sensations, and of comparing them, so as to reproduce others, through itself, and from its own origin? I am inclined to answer these questions in the

affirmative. For, as soon as the senses are stimulated, the sensation is communicated to the sensorium, where it makes a real, corporeal, and sensible impression. All this is accomplished by means of the nerves, because the nervous energy appears to be more nearly allied to the mind, than any other power. The more frequently, therefore, the same stimulus and impression is repeated, the more firmly the idea of it is imprinted, and the longer we retain the impression. If the stimulus be too violent and permanent, or if an impression of too many objects be at once made on the brain, our nerves experience the same relaxation as the chords of an instrument, after a strong and repeated tension.

Man, when he is without clear consciousness, and in the moment of confusion, feels as if his mental powers were palsied, or had suffered a temporary suspension. In a severe disease, and previous to death, we perceive the ideas of early life vanish first; we lose the impressions of such ideas on the brain more readily, in proportion to the distance of time when they were made, or accordingly as they have been more or less frequently repeated. If eventually the patient recover, he may without difficulty observe, how progressively the suppressed ideas re-appear in the head, exactly as if they had been stored up there, and remained in a latent state, till the soul attained sufficient energy to use them.—From this indubitable fact, I am disposed to deduce a stronger argument for the immortality of the soul, than from any other physiological source.

The organs by which the sensitive powers of the nerves can be excited from without, are called the senses; in contradistinction to the *internal* faculties, such as imagination, memory, attention, and the various affections of the mind. The latter we exclude from the present inquiry, which is directed to the *external* senses alone. The number of these has been hitherto limited to *five*, or, it may be said with more propriety, that they are five modifications of *one* sense.

This universal sense, which in a manner forms the basis of all others, is that of *Touch*. If we abstract from the difference subsisting in the structure of the organs, the other senses are subservient to that of touch, and little more than a variety or modification of it. All the senses agree in this, that they may be improved by exercise, or depraved and blunted by neglect: Nature has not formed them to the same degree of perfection in every individual. The loss of one sense is, in general, partly supplied by the greater perfection of another; yet it is equally true, that exercise and attention are the principal sources of this improvement.

In the most perfect state of our senses, we are liable to be misled by them into many errors and mistakes; but the sense of touch or feeling is least liable to deceptions, while that of sight is the most uncertain. The order in which we shall consider the five senses, hitherto admitted as being distinct from one another, is the following: viz. 1. *Touch*; 2. *Sight*; 3. *Hearing*; 4. *Smell*; and 5. *Taste*.

—Beside these, there are perhaps several others, which deserve to be added to that number; such as hunger and thirst, and the sensations peculiar to the different sexes. If these be not admitted as distinct from the five others, we may still discover a *sixth* sense in the animal œconomy. And though this additional sense is chiefly manifested in diseases, and scarcely perceptible in a healthy state of the body, yet its existence is so obvious to patients in chronic disorders, and particularly in palsy, gout, and rheumatism, that they are thereby enabled to ascertain, with wonderful accuracy, not only the present state, but also to predict the impending changes of the atmosphere.

Without losing time in abstruse disquisitions respecting these occult senses, I proceed to examine those which are more generally known.

The *first*, namely, that of *Touch*, comprehends not only the sensation which is excited by any particular impression, but also that change which external objects produce on the skin, and particularly on the ends of the fingers. It is in the latter, and more limited meaning, that I now consider the sense of touch. In order to understand more clearly the great importance of this sense, I shall premise a concise description of the external integuments of the human body. For there is no doubt, that the skin is the medium of all the senses, and, if I may be allowed the expression, it is the most unerring guide, and least subject to the illusions of the imagination.

The whole human body is inclosed in certain integuments or covers: they consist of *three* different layers, each of which is wisely designed by Nature for protection, benefit, and ornament. The uppermost, that is, the scarf-skin, or *epidermis*, is the thinnest of the three, and is nearly transparent. It covers the whole body, both externally and internally, not only the mouth, stomach, and bowels, but also every cavity and protuberance of the body; as it forms the upper skin of most of the intestines, the lungs, the heart, the liver, the spleen, &c. This covering is of great service to the whole frame, by protecting the parts inclosed in it from external injury, by preventing them from growing together internally, and by keeping every thing within the body in its proper situation. It is destitute of sensation, which even children know, since they run pins between it, without feeling pain. But it is possessed of the admirable property, that it is very quickly renewed, after it has been destroyed by accident, or by the measles, scarlet-fever, and similar diseases.

Immediately under this universal and uppermost covering of our body, there lies a second, reticular, and mucous membrane, which has received from anatomists the name of *rete mucosum*. It is in most parts of the body extremely thin, but it grows considerably thicker in others, for instance, on the heels and the palms of the hand.

This second skin deserves particular attention, as it is the seat of the colour in different nations; though the cause of this diversity has

not yet been discovered:—in the Negroes it is black; in the American Indians nearly of copper colour; and in the Europeans generally white. That the colour of the human body is altogether contained in this second or middle skin, is sufficiently ascertained: for not only the third or true skin of the Negroes is as white as in the Europeans, but the uppermost, or scarf-skin too, though rather of a greyish tint, is scarcely darker in blacks than in white people; and in the latter also the middle skin frequently is of a yellowish, brown, or blackish colour; in which case the whole external skin exhibits a similar appearance.

This variety of colour has led some authors to suppose, that there is a variety in the origin, as well as in the mental capacities of different nations. So palpable an error, however, could not long remain unrefuted: and it is now almost universally admitted, that there was originally but one species of man, though diversified by the climate, the air, the sun, and the mode of living, which produce all the difference in the colour, as well as in the structure of man. Thus we know that those Americans, who live in the calmer western and mountainous regions, are not of so deep a copper-colour as those who are more exposed to winds and other contingent causes; that the inhabitants of the northern bank of the river Senegal are of a diminutive size, and of an ash-colour, while those of the opposite bank are black, and at the same time tall and robust. We farther know, that after

some generations, the Negroes are bleached, and people of a white colour become black, when the former emigrate to the cold northern, and the latter to the torrid southern climates. This difference is also discoverable in our climate, where people moving much in the open air and sunshine acquire a dark colour, somewhat resembling that of the swarthy Portuguese.

That there may be also a colouring substance in the blood, whether owing to the iron said to be contained in this fluid, to the bile, or to an excess of what the old chemists called *phlogiston* (or what would now be termed the want of *oxygen*)—all of which may have a share in the modification of colours, I am much disposed to admit; because the blood, bile, brain, nay the very vermin on the bodies of the *Æthiopians*, partake of their native colour.

The *third* and innermost of the integuments of our body is the true skin, or the *cutis vera*, which immediately covers the fat and the muscles. It is of a compact, interwoven, cellular texture, which is very thick and smooth on its upper surface, of a white colour in all nations, loose or pliable on its inner surface, and furnished with more or less fat. It not only possesses a considerable degree of expansibility, and contractility, but is also provided with numberless pores. Its thickness varies in different individuals. It is traversed by a great number of fine arteries, interwoven in the form of a net, and which may be exhibited to the eye by injecting them with a red flu-

id, so that the skin then has the appearance of being thoroughly coloured. It is likewise furnished with an equal number of veins, and delicate absorbent vessels.

From the many nerves which pervade the true skin, it possesses an uncommon degree of sensibility, especially in those parts where we can perceive the *papillæ* of the nerves. These are small protuberances of different figures, of a reticular structure, and a pulpy consistence. In some places, as the lips, they are not unlike flakes, though they generally resemble little warts. Such we observe on the points of the fingers and toes, as well as on many of the most sensible parts of the body, but particularly the tongue. They are most visible on the ends of the fingers in delicate persons; they can be traced, with the naked eye, by the spiral lines terminating almost in a point, and are protected and supported by nails proceeding from the skin which grows over them. It is in these papillary extremities, that every external impression is most distinctly and forcibly perceived, on account of the number of nerves lying almost exposed to view in these places.

The sense of touch can be improved, by practice, to an astonishing degree. There are many examples of blind people having attained so great a perfection of this sense, that they could with accuracy distinguish the difference of coins, of metals, and even of colours, merely by the touch. I myself knew a blind man, who had learnt to take a watch to pieces, to clean it perfectly, and to put it together again, without any other assistance, but that of the

instruments commonly used, and the exquisite feeling of his fingers.

I have now only to describe the operation or mechanism of this sense.—When the nervous papillæ are pressed against external objects, the nerves receive a kind of vibration, which is communicated to their branches, and thence to the brain. Thus we are enabled to feel the hardness, roughness, moisture, warmth, gravity, figure, size, and even the distance of bodies. But, that this feeling may not become painful, Nature has provided another cover, namely the scarf-skin, which serves the important purposes of secluding the air from the true skin, and preventing the body from being too much dried.—The nails increase the energy of touch, and render the sense of it more acute, as they resist the pressure of external objects.

The *second* of our senses, though less essential to animal life, is more conducive to our welfare and happiness. Without *Sight* we cannot justly contemplate the wonders of Nature, and existence is deprived of its greatest charms. An anatomical description of the eyes would lead us too far from the object of these inquiries, and would not be intelligible without a more particular analysis and demonstration than our limits allow.

In the sense of sight, we are far excelled by most of the lower animals. Eagles and hawks, in particular, descry their prey, when beyond the reach of our sight, though aided by a telescope. Yet in men, also, this sense may be wonderfully improved, and I remember to have heard the celebrated *Baron Trenk* assert,

that during his long captivity in the state dungeon at Magdeburg, he had so much improved his sight, that he could see the mice traversing his gloomy cell in the middle of the darkest night—whether this assertion was exaggerated, I do not pretend to decide.

The operations of sight are performed in the most accurate manner. By the structure of the eye, no rays of light can pass into it, unless emitted within an angle not exceeding 90 degrees. Every thing here is regulated upon optical principles, sensation excepted. This is situated in the *retina*, a membrane having the form of a net, and being, as it were, the mirror by which external objects are represented to the mind. If this mirror be destroyed, as is the case in *amaurosis*, or *gutta serena*, our sight is irrecoverably lost.

All vision consists in the refraction of the rays of light, by means of the crystalline humour, till all the rays are concentrated into one distinct image on the retina. The rays of light, while they pass through the arched surface of the *cornea*, or the horny skin, are broken and brought in contact with each other; and this is still farther promoted, while they pass through the more dense crystalline lens. They then converge at the spot where the vitreous humour is contained: here they again diverge, once more come in contact, and finally collect in as many points as are represented by the external object. This image, which is depicted on, and stimulates the retina, is communicated to the mind, and produces the sensation of sight.

It is partly owing to the above-mentioned refraction, partly to the constant and uniform reference to the internal sense, that in the act of vision we see objects in an upright posture before us, though they are properly imprinted on the retina, in an inverted posture. By this admirable mechanism, all objects are invertedly presented to the eye, so that we cannot err in this respect, since the relation and proportion of things uniformly remain the same.

But it will be asked, how does it happen, that with two eyes, we see only one object? This question is easily answered by those, who inform us, that with two nostrils we are sensible of only one particular smell, and with two ears we hear but one distinct sound; that a similar external stimulus, in similar nerves, will always produce the same internal sensation, and that accidental deviations, or diseases only, can affect this principle. Yet the explanation now given is altogether insufficient, as it proceeds from analogical reasoning.

If we wish to form a clear conception of this faculty, we must above all things direct our attention to the *axis* of vision, or that imaginary line, which we draw in a straight direction from the centre of the eye to the object, and which is prolonged before and behind that organ. We must next advert to the situation in which the eyes are placed. They do not lie perfectly straight in their sockets, but somewhat in an oblique direction towards the nose. If, then, we prolong, for a short space only, the axis beyond the eye, we shall soon find,

that the two imaginary lines meet in a certain point. This is called the *Focus*, or the point of vision—the termination of the external rays of light.

If a person be able to see to a great distance, his lines of vision intersect each other at a greater distance from the eye, and consequently his focus is farther removed from it. This defect is called *presbyopia*, or far-sightedness, and may be remedied by means of convex glasses; but, if from the too great convexity, or an extraordinary converging power of the eye, the rays of light too soon unite in one point, and, as this point is placed before the retina, from whence the rays of light again diverge, vision becomes indistinct, till the object be brought nearer to the eye; in order to place the point of union, as it were, farther behind the eye—this deficiency of vision is called *myopia*, or short-sightedness, and may be relieved by concave glasses. Of these, as well as other defects of the eye, and the most proper methods of preventing and curing them, I shall treat in the next Chapter.

It farther deserves to be remarked, that the optic nerves cross each other in the brain, and that we are accustomed, from our infancy, to see only one object at a time. Hence children should be so placed in bed, that they may not learn to squint, or that the eyes may not be directed upwards and outwards, but rather downwards and inwards, in order to habituate them properly to form the axis above described. That custom has great influence, in this respect, is obvious from the circumstance, that

those who squint, not unfrequently see two objects at once ; and that such eyes, as by accident or disease have become double-sighted, may, by continued exertions, be again habituated to view objects distinctly.

Every one must have observed, that upon entering suddenly from a very dark place into bright sunshine, he could scarcely see any object, has felt pain in the eyes, shed involuntary tears, or sneezed. This temporary deprivation of sight is owing to the pupil of the eye being dilated in a dark place, and contracted again at the approach of light. The dilatation and contraction of the pupil is in proportion to the darkness or brightness of the place. If the change from a dark to a bright place be instantaneous, the pupil cannot dilate and contract quickly enough ; it is, as it were, palsied, together with the retina, and we cannot see at all. The pain of the eyes, and the flow of tears under these circumstances, must be ascribed to similar causes. Every stimulus whether occasioned by heat, cold, winds, colours, and the like, excites a sensation, which is agreeable, if it be moderate and not too long continued ; but which becomes painful and disagreeable, as it increases in violence and duration. There remains another curious phenomenon to be explained, namely, that of *sneezing*, which often takes place, when we suddenly go from darkness to a strong light. Here the same cause operates, though under different circumstances. The optic nerves consist of the second pair of the nerves of the

brain; with these are united the third pair, the fourth pair, and some branches of the fifth and sixth pair. Yet the second pair, or the peculiar optic nerve, has the most important share in vision. It proceeds from the brain straight to the pupil of the eye, pervades this almost through the middle of its posterior internal part, where it terminates and dilates itself, or, as it were, melts into a soft, downy skin, forming the *retina*, which covers a great part of the posterior internal eye.—Now, from the fifth pair of nerves there proceeds but one branch into the eyes, while another takes its direction to the nose. When the eye is suddenly impressed with the rays of light, that branch of the fifth pair which extends to the eyes, is stimulated in common with the other branch of the same pair proceeding to the nose. If the stimulus be violent, it is communicated to both branches, that of the nose is likewise stimulated, and we are compelled to sneeze.

To conclude the account of the sense of sight, I must remark, that the representations of the mind scarcely display their influence on any other of the senses, to so extensive a degree, as they do upon this: hence it happens, that we sometimes imagine we see images before us, in the clearest manner, though the representation of them be merely a phantom of the brain. The impression forcibly made on the retina, remains there for some time, even after the object itself has vanished; thus we imagine we see a fiery ring, when a burning coal is swiftly moved in a circle.—That we believe we see many bright colours, when we

rub and press the closed eye with the fingers, is owing to this cause, that the same kind of effect is produced on the nerves of the eye by friction, as usually accompanies the view of the colours themselves. But whether colours, in general, depend on the different degrees of vibration of the air, or on the elements of the rays of light, which, by their division, appear singly and distinctly in the prism, is a problem not yet, and which perhaps never will be, satisfactorily solved.

By the next sense, namely, that of *Hearing*, we perceive the vibrations of the air which occasion sound. For this purpose our ears are formed partly of cartilages, and partly of bones, in order to communicate these vibrations to the auditory nerves, and thence to the brain. This sense also is more acute in the lower animals, than in the human species. The hare, for instance, is warned against approaching danger, by her exquisitely fine ear; and the owl, being sensible of the softest sounds, makes use of her acute ear to assist her in the discovery of prey.

The warm-blooded animals have an external and an internal ear; but in almost every species it is of a different structure. Most animals can move their ears—an advantage not enjoyed by man; though it was not Nature which formed our ears immoveable, but an absurd custom, continued for many centuries, gradually produced this effect. That the ears were not naturally designed to lie flat on the head, is sufficiently obvious from the number of muscles with which they are provided, and

each of which is designed to perform different motions.

The manner in which the sense of hearing is produced, is shortly this. The vibrations of the air, which take place by the concussion of any elastic body, first strike the external ear ; hence the sound agitates the *tympanum*. But that the vibrations may not become too violent, and the tympanum may not burst, as is to be apprehended from a very loud and near sound, the ear is provided with a siphon, which anatomists call the *Eustachian tube*, and through which the air collected on the tympanum again escapes. But the vibration of the tympanum is also communicated through the four little bones of the ear ; it is forwarded through what is called the *stapes*, or stirrup, to the vestibule, or the first entrance, and through the membrane of the *fenestra rotunda*, as far as the innermost cavity of the ear, which resembles the shell of a snail, and is therefore called *cochlea*. The whole labyrinth of the ear being filled with a subtile water in small quantity, this fluid gently agitates the substance of the auditory nerve ; in consequence of which sound is communicated to the brain. The humour contained in the labyrinth of the ear obviously serves the purpose of preventing the soft, pappy substance of the auditory nerve from being too violently agitated.

The use of the cochlea, which is very artificially constructed, cannot be easily determined ; it is probably rather designed for the more accurate distinction of the varieties of tones, than for the perception of sounds in

general ; for we may consider the delicate nerves, that run along the spiral line of this cochlea, as a number of chords growing progressively shorter, and which, in a manner, repeat the external vibrations of the air, in the internal parts of the ear. This repetition appears to be performed according to a geometrical scale, since the same vibrations of the air take place here in a reduced proportion. Hence sounds, which are too loud and penetrating, offend our ears, because they shake the auditory nerves too quickly and violently, so that these may even be lacerated, and produce deafness ; but this is not the case, when the tympanum is broken by accident.

Some persons, who are defective in this sense, are obliged to make use of ear-trumpets, and to turn their ear to the quarter whence the sound proceeds ; to place the hand at the side of the ear ; to open their mouth, or use some other assistant means. All this is done with a view to supply the motion of the ears, of which we have been deprived by habits contrary to the laws of Nature : these motions the lower animals perform, by pointing their ears in the direction from which the sound proceeds. In this manner, the ear receives a greater proportion of sound ; and many divisions of it, which might otherwise escape, are conveyed to the nerves.

By means of the teeth, and other bones of the head, sounds may be conducted to the auditory nerves, so as to communicate the necessary vibrations to the internal ear, though we can hear more easily and distinctly, when the

found comes through the organ itself. There is, however, a method of communicating sounds to the deaf, with better success than by the common ear-trumpets, which instruments at length entirely destroy that sense. This is effected by means of a cylindrical rod or tube of ivory, or any similar hard substance : the rod may be from six to twelve inches long and upwards, and from a quarter to half an inch in diameter ; if it be made hollow throughout, the part which is placed in the mouth between the front teeth ought to have a much smaller aperture than the other extremity. This tube is well calculated to assist those deaf persons, who wish to enjoy the music of a harp, harpsichord, or other instrument. I once knew a gentleman, who was quite deaf, but with the assistance of a cylinder, such as I have described, was enabled to hear the softest notes distinctly, and to enjoy all the pleasures of music.

Lastly, it is a false assertion, that there is always a hole in the tympanum ; for it is owing to the double opening of the Eustachian tube, that many jugglers can cause the liquor they drink to flow out of the ear, in the same manner as they discharge the smoke of tobacco through the nose and ears.

Our *fourth* sense is that of *Smell*. It is nearly related to the sense of taste, probably from the great similarity of structure in the organs of these two senses, and their vicinity to each other. This is attended with the manifest advantage, that man and animals are generally enabled to discover, without danger, any un-

wholesome food. The functions of this sense are exercised by the nose, and chiefly by the mucous membrane which lines that organ. The whole inside of the nose is covered with this membrane, which is a continuation of the general integuments of the body, but much softer, more mucous and porous, full of vessels, exquisitely sensible, and covered with hair towards the lower part of the nostrils, to prevent any impurities from ascending too far.

Of all the parts of the mouth connected with the nose, the most remarkable is the cavity of the jaw-bone, or the *sinus maxillaris*, which extends over the whole breadth of the two upper jaw-bones, and opens itself into the nose between the middle and lower shell. In newborn children, all these cavities are not yet formed, and this is the cause of their imperfect smell. In order to moisten the membranes, which otherwise would become too dry, by the air we inhale through the nostrils, there descends a nasal canal from each cavity of the eyes, which communicates with the lower shell, in order to conduct the tears continually into the nose.

If we make an effort to smell, we draw up the air filled with the volatile, oily, and saline particles of odorous substances: these particles come in contact with the fine branches of the olfactory nerves, which have the capacity of receiving impressions, and thus the sensation is imparted to the brain. These nerves rise immediately from the brain, and are larger in many animals than in man. The bigness of the nerves, however, is no proof of the great-

er degree of sensation in the animal, or of the superior abilities of the mind. On the contrary, it is now pretty generally believed, that the mental capacities of organized beings are in an inverted proportion to the size of the nerves rising out of the brain, and the medullary substance of the spine. Thus, for instance, the amphibious animals have strong nerves, in proportion to their small brain, and yet they are, in general, extremely insensible and stupid. Lean people, and ricketty children, on the contrary, have very thin and fine nerves to a large brain; and who has not observed their sensibility of mind, as well as their quick and acute feelings?

But to return from this digression.—The saline and oily particles which affect the smell, are more volatile and subtile than those distinguished by the taste; yet this difference may in a great measure arise from the nerves of the tongue being covered with thicker membranes than those of the nose.—In many animals, the sense of smelling is more acute than in man, who would probably be much incommoded by too refined a perception of this kind. But it may be much improved by exercise, or depraved by neglect. Hence the American Indian can discover the footsteps of man and other animals by smell alone;—while persons who live in a bad and fetid atmosphere, are scarcely sensible of the difference between the most fragrant and offensive substances.—It is remarkable, that most maniacs and inveterate hypochondriacs, are ex-

cessively fond of snuff, and every thing that stimulates the nose.

Of all the quadrupeds we know, the dog excels in the acuteness of this sense; and there are many extraordinary instances recorded of his peculiar and astonishing powers of smell; with one of which, as well authenticated as it is extraordinary, I shall conclude this subject.—In the year 1582 *Leonhard Zollikofer* set out from his Chateau Altenklingen, in Switzerland, for Paris; the distance of which is upwards of five hundred English miles. A fortnight after his departure, his faithful dog, who had till then been confined, also set out alone for Paris; where he arrived in the course of eight days, and discovered his master in the midst of a crowd, after having searched for him in vain at his lodgings.

We are now arrived at the *fifth* and last of our senses, the *Taste*, which is so distinguished a favourite of a great number of persons, that it appears, as if they wished to live only for the sake of its gratification. I have in former parts of this work endeavoured to inculcate the propriety and absolute necessity of attending to the effects produced on this sense by food and drink, without which animal life cannot be long supported. In this place, therefore, there remains to be described only the mechanism and the functions of this sense.

The principal organ of taste is the tongue, which in very few animals is as sensible as in man. The former choose, indeed, among the

herbs upon which they feed, by accurately distinguishing the useful from the noxious plants ; but this appears to be more in consequence of their acute smell, than from the guidance of their taste. To describe the figure and shape of the tongue, is not consistent with my plan ; but I shall briefly observe, that this organ is provided with innumerable nerves, which terminate in certain warts, or papillæ, of a different size and figure, some of them pointed, others oblong, and others fungous.

These nervous papillæ are the peculiar seat of the sense of taste, or the palate. But, to taste any thing whatever, either the tongue should be moist, or the substance applied to the tongue should contain moisture. In ascertaining the difference of taste, the little warts are, in some degree, dilated : every substance we can taste, contains a greater or smaller proportion of saline and oily particles, which must be soluble by the tongue. If the sensation of the saline particles be acrid, the taste is strong, disagreeable, and at length becomes painful : this is also the case, if the tongue, by burning or other accidents, be deprived of any part of the epidermis, or scarf-skin.

Such bodies as contain no saline particles, as pure water, excite no kind of taste whatever. The difference of taste cannot be accounted for from the variety of figure in the crystals of the different salts, but appears to arise from the chemical properties inherent in saline bodies.—It may be laid down as a gen-

eral rule, that every substance, which affords an agreeable taste to a healthy person of an undepraved palate, is wholesome: as, on the contrary, substances of an acrid and disagreeable taste are commonly pernicious.

The different degrees of taste depend on the greater or less sensibility of the nervous papillæ before described, as well as on the quality of the saliva, in a more or less healthy state of the body. If our nerves be blunted and weakened by smoking tobacco, by too strong and highly-seasoned food, by the copious use of spirituous liquors, by age, or other causes, we cannot reasonably expect to possess the same degree of sensibility of taste, as if we had been more attentive to the ordinances of Nature.—The more simple our usual aliment is, the less it is seasoned by hot spices and the less we stimulate the palate by wine and ardent spirits, we shall the better preserve our taste, together with the nerves of the tongue; and we shall have a greater relish for rich dishes, when they are but occasionally presented to our palate.

The senses, then, are those organs, by means of which the mind perceives or feels external objects. They may be considered as the satellites of the mind; and although some animals enjoy particular senses more acutely than man, yet his senses are more comprehensive, and he is amply compensated by the extensive use he can make of them, while the inferior creatures possess a more intensive application of their sensitive faculties.

We have now considered the mode in which the senses operate ; we have seen that every thing depends upon a nervous stimulus, which, by the most diversified organs, is communicated to the mind : there remain to be added only a few remarks and explanations, relative to animal motion, or muscular action.

The machine of the human body is put in motion by a great diversity of powers.—Of these, the highest and most energetic is that of the *mind* ; the next subordinate power is that of the *nerves*, immediately after which follows the most operative of the corporeal powers, that is, *muscular irritability*, or the peculiar faculty of the muscles to contract, in consequence of any stimulus applied to them. I purposely omit in this place, what physiologists have called the vital power, the peculiar power of life, or BLUMENBACH'S *vita propria* ; and the healing power of Nature, or *vis medicatrix naturæ* of the ancient physicians. All these powers are, in a great measure, hypothetical, though their frequent operations in a diseased state of the body cannot be denied. And, as the muscular powers of men and animals are the most obvious to the senses, I shall content myself with stating what has a reference to these.

A *muscle* is a bundle of thin and parallel plates of fleshy threads or fibres. These are connected by a loose and generally fat cellular membrane ; they separate into greater bundles, till at length several portions of a muscle lying parallel, or inclining towards one another, are again surrounded by a tender membrane of

a cellular texture, which forms one substance with the collateral partitions; and these, being again separated from the contiguous flesh, by a somewhat thicker cellular texture, are then considered as one distinct muscle.

The human body has a considerable number of muscles, yet many of the lower animals are provided with a much greater proportion of them. The caterpillar (*Phalæna Cossus*, L.) has about 3500 muscles, while the human body can count scarcely 450. The muscles of animals, in general, are more powerful than those of man. What astonishing power, for instance, is the leaping chafer, or the grasshopper, obliged to employ, in order to make jumps, which extend to several hundred times the length of their own bodies! Another small insect, the flea, excels all other animals in its prodigious leaps, and is able to carry a weight 80 times heavier than its body. All these apparent wonders are accomplished by means of the muscles. The figure of them, in man, is very irregular; those only, which are designed to perform certain *valvular* motions, such as the muscles of the mouth, the eye-lids, the bladder, the anus, &c. are of a circular or round figure.

All the muscles contract in the direction of their fibres; the middle part or the belly of the muscle swells, hence it gets shorter, and both ends approach one another. Most of our muscles operate in the manner of a lever; the two ends of every muscle, in the extremities of animals, are fastened to the bones, by means of

tendons or sinews ; one of these extremities only being moveable, while the other remains fixed. Hence, in the contraction of the muscles, the moveable bone is drawn according to the direction of their fibres. If a muscle be contracted, it necessarily swells in thickness, as may be distinctly felt by placing the hand upon the *masseter*, a muscle of the lower jaw, and compressing the back teeth. As soon, however, as the nerve of the muscle is cut, or tied only, the contracting or swelling power instantly ceases, whence we are inclined to suppose, that the nerves have the principal share in regulating the powers of contraction, extension, and loco-motion. Whether this be done by the influx of a fluid into the nerves, or by some other latent power, has not yet been discovered.

The energy of muscular action is remarkable in every healthy individual, but particularly in very strong men, and frequently too in maniacs. With the assistance of a few muscles only, they are enabled to raise a weight, often much exceeding that of the whole human frame.—In order to support the pressure of the lever, which is accomplished with a great loss of power, and to preserve and consolidate the muscles in their situation, they run at one time under cross ligaments, as is the case on the fingers ; at another time they move in rollers, for instance, in the eye ; and, again, in other places, they are supported in their position by the peculiar structure of the bones, as we find on the upper part of the shoulders.

If a computation could be made of all the losses of power which the muscles experience,

partly by their frequent insertion at very acute angles, partly by their being extended as a chord, and drawing a weight opposite to its fixed point; partly by passing over certain joints which break the force to be applied to a particular joint; and, lastly, by their fleshy fibres being obstructed by the angles they make with the tendons;—if all these impediments could be reduced to an accurate calculation, we should be astonished at the contractile force exerted by the muscles, as it would exceed any amount of powers raised upon mechanical principles. It is confidently asserted, that the effect is scarcely $\frac{1}{100}$ th part of that force which the muscles employ; and yet a small number of them, the substance of which is equal in weight to a few pounds only, possess the power of lifting, or at least moving, several hundred weight, and this with inconceivable facility and swiftness. It would be presumptuous to ascribe the great losses of muscular power to any defect in the animal economy: for, if we had the full use of our muscles, the just symmetry or proportion of the parts would be destroyed, and it might otherwise be attended with many physical evils, the consequences of which we cannot comprehend.

As an ample compensation for the want of this unnecessary strength, Nature has provided the upper ends of the muscles, which bend the joints, and chiefly those of the knees, with certain bags, *bursæ mucosæ*, which contain a lubricating mucus, to facilitate the motion of the tendons. And to this beneficent arrangement we owe the ability of exercising the power

of the muscles with such extraordinary activity, and without feeling them rigid and inflexible, after violent and long-continued exercise.

Being now acquainted, in some degree, with the *nerves* and *muscles*; it will also be necessary to say a few words relative to the *blood*; especially as the doctrine of *temperaments*, already treated of in the Introduction, was principally founded on the nature of these three substances.

The quantity of blood in a human body of full growth, is generally computed at 30 lb. This liquid apparently consists of two parts only, namely, the *serum*, or water, and the *crassamentum*, or the thick and coagulable part of the blood. But, as the latter can be again separated into two parts, namely, the *cruor*, or the thick and red part, and the coagulable *lymph*, the blood consequently consists of three principal constituents: the serum, the cruor, and the lymph. Besides these, there is also a considerable quantity of air contained in the blood, which is, as it were, the medium of combination in all vegetable, animal, and mineral bodies; for, when the air is expelled, whether by combustion, fermentation, putrefaction, or any other process, they hasten towards their inevitable dissolution.

There is further contained in the blood, much water, a small proportion of oil, some salt, earth, and a little iron, which, together with the heat produced by respiration, is supposed to impart the red colour to that fluid. The red colour is confined to the *cruor*, which consists of very minute red globules, nearly resembling in shape the eggs of silk-worms.

Much remains to be said on the properties of the blood, and its wonderful circulation in the human body ; but, as this subject, from want of room, cannot be satisfactorily discussed here, I am under the necessity of concluding this Chapter with the following remark : that the variety of temperaments in man appears to be owing to the different mixture of the fluids, and the diversified structure of the solids, particularly of the nerves and muscles. This is so true, that the whole picture of his physical life, together with his moral character, depend chiefly on the various combination of these parts. Yet there are different means by which peculiar temperaments are generated ;—the first of these is *climate*, which forms the national character ;—the second is a certain *hereditary disposition*, which we derive from our parents ;—and the third is the peculiar *organization* of the individual.

C H A P. XII.

Practical Remarks and Rules relative to the TREATMENT AND PRESERVATION OF THE EYES :—On the importance of bestowing proper care on these organs—Of Short-sightedness, and the reverse—General Rules for the Preservation of the Eyes—Of the Conduct to be observed in Weak Eyes—Dietetical Precepts respecting the Eyes in general—Some additional Rules addressed to those who are obliged to make use of Eye-Glasses.

1. *On the importance of bestowing proper care on these organs.*

THERE is scarcely any part of the sensitive faculties, which contributes more to our physical enjoyments than the unimpaired power of vision. Hence the management of the eyes deserves the care and attention of every person, who wishes to preserve them in a sound and perfect state, and to retard, although we cannot altogether avert, the natural consequences which accompany the advance of years. By our mode of life, this infirmity is much accelerated, and the eyes are weakened and worn out, or at least rendered too irritable. Such is particularly the case in those classes of people, who are much employed in sedentary occupations, who work by candle-light, or are much exposed to dust, &c.

The remarks, rules, and observations of this Chapter will relate chiefly to the treatment, both of sound and weak eyes, and occasionally also to the regimen of them in a diseased state.

More accuracy and attention is required in this respect, than inexperienced persons generally imagine. Till of late years, proper attention has not been paid, to lay down and establish well-founded and practical rules on the subject of the eyes, and their treatment. Some modern physicians and oculists, however, have usefully devoted much time and labour to inquiries into the maladies of this organ. The fruits of these researches, as well as my own experience, on this point, I now proceed to lay before the reader.

II. *Of short-sightedness, and the reverse.*

MAN probably enjoys his sight to a later period of life than any of the lower animals, and might preserve it still longer, if he were better informed respecting its preservation. Those who are naturally short-sighted, are entitled to expect an improvement of vision with the advancement of age ; for their eyes then gradually begin to lose that uncommon roundness which produces this defect, and thus to arrive at a greater enjoyment of the beauties of Nature. Persons who can see objects distinctly at a great distance only, cannot, however, be considered as less unfortunate ; as they stand

in need of glaffes, chiefly for the better diftinguifhing of more minute objects.

The nurfery, or the room appropriated to the ufe of children, is generally the fmalleft, if not the loweft apartment in the houfe ; fo that the infant, having the opportunity to exercife its eyes on near objects only, often becomes more fhort-fighted than it is naturally. Hence children ought at leaft to be frequently carried to the window, and have their eyes directed to a diftant view. On this account, a nurfery enjoying an extenfive profpect is much preferable to one where the view is confined. Many perfons who fee well at a diftance in their infancy, injure their fight by reading and writing by candle-light, but particularly females, by fine needle-work ; as the eye is thereby too much accuftomed to near and minute objects.

One of the bad confequences of fhort-fightednefs is, that people get into a habit of making ufe of one eye only. The effort of directing both pupils to the object before them is attended with too much trouble ; hence they look at it fide ways. It would be lefs detrimental, if they were to ufe the eyes alternately ; but here too it is equally eafy to acquire a bad habit ; for the eye, which is fpared or not exercifed, becomes inert and ufelefs. Still worfe is the ufe of a magnifying or reading glafs, by which people accuftom themfelves to fhut the eye then unemployed. The other, which is thus unduly exerted, fomewhat fhifts its pofition, it becomes progressively lefs flexible in its internal parts, and perfons who take advan-

age of this temporary aid, do not find their powers of vision improve with the advancement of age.

To prevent these bad habits, the following advice may be useful :—Children suspected of being short-sighted, should have their eyes directed to an object held close to them ; and if they appear to make use of one eye only, that eye should be occasionally closed, so that they may be obliged to exercise the other. When they learn to read, they should be taught to hold the book straight before their eyes ; thus they will exert themselves to discover the printed letters at the greatest distance at which they are made to place it. The eyes, by degrees, become accustomed to the necessary internal change of their posture, and the child will, in time, certainly improve in the extension of its sight. Many persons indeed have, at a juvenile age, got rid of their short-sightedness ; but there cannot be found one instance of this improvement among those who have, either from fashionable indulgence or necessity, habituated themselves to use only one eye.

It is to be regretted, that in short-sighted individuals the breast and abdomen suffer much from compression during sedentary occupations, so that they are frequently troubled with hypochondriasis, and, what is still worse, are sometimes thrown into a consumption of the lungs. Though standing at intervals agrees with employments that do not require great mental exertion ; yet, in the contrary

case, it consumes more strength than is generally imagined; and, in acute reflections, the mind ought not to be fatigued by the body. In this case, well-chosen *concave spectacles* may be used with advantage, so that the body may be placed, while reading or writing, in the most convenient posture: for such glasses will oblige the wearer to remove the object somewhat farther from the eyes.

After severe diseases of the eyes, one of them frequently becomes short-sighted, while the other is scarcely, if at all, affected. The consequence is, that we employ the sound eye alone, while the weak one is totally impaired by this neglect. In such a situation, we ought to use glasses in reading or writing, one of which should be carefully selected for the short-sighted eye, (according to the rules hereafter to be specified) and the other of plain, clear glass, chiefly for the sake of affording an equal degree of light to both eyes. If, by this precaution, the weaker eye has perceptibly gained strength, we may employ a less concave glass instead of that first used, so that in time it may be similar with the other, and at length the patient be enabled to do without this assistance.

Eyes which form too extensive a focus, require no aid, unless they be extravagantly so. Then, indeed, we should not hesitate to make use of convex glasses. It is, however, a vulgar prejudice, that by such glasses the eye is too much indulged, and rendered still more *far-sighted*. On the contrary, it is generally improved during the use of these spectacles,

and, after the lapse of several years, they may again be dispensed with.

It is a consolation in many diseases of the eyes, that a long-continued weakness is seldom the forerunner of total blindness. This fatal event generally happens by sudden accidents, and is speedily decided.—Adults are not very subject to external complaints of the eye, or such as deprive the *cornea* of its transparency.

Small round spots, hovering before the eyes like strings of hollow little globules connected with one another, are defects of no great consequence, and of which, perhaps, no eye is completely free.

III. *General Rules for the Preservation of the Eyes.*

IN all employments whatever, let us attend as much as possible to this circumstance, that the eyes may have an uniform and sufficient light, so as to affect the *retina* on all sides alike.—The eyes materially suffer, when the rays of the sun are strongly reflected from the opposite wall or window.

In children, many disorders of the eye, which would never have had so fatal an issue, have terminated in total blindness, when parents have neglected to provide the cradle or window with proper curtains. For this reason, we ought to be extremely cautious in the choice of an apartment appropriated to the

labours of the day. We should not place ourselves directly opposite to the light, in reading and writing; we ought rather to take the light in a lateral direction.

A great obstacle to this arrangement is the change of light in the same apartment, by the progress of the sun. Where the sun dazzled in the morning, we find in the middle of the day the most uniform light, which again in the afternoon, particularly in towns, becomes reverberatory, and extremely hurtful. This inconvenience should be remedied, if possible, by a frequent change of the room; or, at least, we might produce more uniformity in the light by means of window curtains, or blinds; and it may be observed, that blinds of green or whited-brown linen are best adapted for this purpose.

It is an useful practice to protect weak eyes from the descending rays by means of shades; because the vivid light striking them from above, is thus intercepted. But we ought to consider, that the lower part of the eye is by such means completely shaded; while the upper part of this organ is stimulated by the light it receives from below;—a practice which cannot be productive of good consequences. If the malady be situated in the upper part of the eye, this conduct is still more improper: for the healthy part is in this manner protected, and that already relaxed is still more weakened.

Darkness, or shade, is then only beneficial to the eyes, when they are unemployed, when the obscurity is natural, and consequently

every where extended. To rest a little during the twilight, is very suitable to weak eyes. No artificial darkness during the day is ever so uniform, but that the eye must exert itself at one time more than at another, and necessarily suffer by this change. Persons with weak or diseased eyes, who spend the whole day in an apartment darkened with green curtains, injure their sight still more by this pernicious practice. It is far more prudent to repair to clear daylight and the fresh air, and to direct the eyes to distant prospects, than to confine them to the close atmosphere of a room, and to the sight of near objects.

Lastly, it is an error, that weak eyes, when employed in minute vision, ought to have a faint light ; for by this practice they are certainly still more weakened. Thus green spectacles are very hurtful to some eyes, as they deprive them of that light which is necessary to a distinct perception of objects.

IV. *Of the Conduct to be observed in Weak Eyes.*

THE artificial light of candles and lamps is detrimental to weak eyes ; not, as some imagine, on account of the light being too strong for the eyes, but because the flame of a candle too powerfully illumines the eye in one point, and does not uniformly stimulate the *retina*.

The means used to prevent the great stimulus from the rays of light are, in general, so

regulated, that the screen may not only cover the flame, but also concentrate the greatest part of the light. Thus the room is darkened, and only a small spot above and below the apparatus is illumined; a practice highly injudicious. The study-lamps, with large round screens, seem to be purposely contrived to impair the soundest eyes, by their continued use. —The green parchment screens formerly used were likewise objectionable; for, though they admitted the free access of light on both sides, yet they produced too great a shade before the eyes. The best and most proper defence of weak eyes by candle-light is a flat screen, projecting about two or three inches over the forehead; or even a round hat, with a brim of a proper size.

Those who are afflicted with weak eyes should always make use of two candles, placed so that their flame be neither too low, nor too high for the eye. This is a circumstance of great importance, as the light, when placed too low, is uncommonly stimulating and fatiguing. Candles have this advantage over lamps, that their light is less offensive to the eye and less pernicious to the lungs; as they do not, in general, emit so much smoke. But, on the other hand, all candles have the following disadvantages: 1. that, by their burning downwards, the fatigued eye is progressively more strained in the later hours of candle-light; 2. that the unequal light they give is attended with the additional trouble of snuffing them; and, 3. that by the least commotion of the air, or, if made of bad materials,

they offend the eye by their glaring light.—Hence a clear chamber-lamp, burning with the least possible smoke and smell, is far preferable and more soothing to the eye, than even wax-candles. Some of the lately-improved Patent-lamps, originally contrived by M. D' ARGENT, in Switzerland, are well calculated to answer every useful purpose; but, instead of the common round screens, I would recommend another, immediately to be described.

Those *screens* are the best, which are applied to one side of the light only, which are not larger than is necessary to cover the flame, and which still admit a small quantity of light to pass through them. This is obtained by a simple contrivance of taffety, slightly gummed, and folded so that it can be carried about in the pocket. These little screens are very convenient in travelling, and are possessed of the essential advantage, that they overshade only the small angle formed for the individual who is affected with weak eyes, without depriving the rest of the company of light. In the day-time, on the occasion of sealing letters, for instance, the light of a candle or taper is more prejudicial to the eye than in the evening.

In the morning we should not too much exert the eyes immediately after rising. Hence it is adviseable to remove the candle to some distance and under shade in the long winter mornings, till the eye be gradually accustomed to it. For the same reason, the window-shutters ought not to be suddenly opened in very bright day-light. This immediate change,

from darkness to the clearest light, occasions sensible pain even to the strongest eye.

Writing fatigues the eyes less than reading; for the letters we form on paper are previously imprinted on the imagination, and consequently require much less acuteness of sight, than the series of letters and words we read. It is, for the same reason, much easier to the eye to read our own hand-writing, than that of a stranger, however distinct. Besides, the letters and lines in writing are more distinguishable by the lower part of the blank paper, than the lines in a printed book, or on a manuscript; in both of which they appear to flow together, and can be kept asunder only by great exertion of the eye. The case is considerably changed, when we endeavour to write remarkably well; when we make use of a glossy white paper, and particularly when we copy the writing of another person with great accuracy—in all which instances the sight is more impaired than in reading, especially by changing the direction of the eyes too frequently to papers, or books of different types.

The extravagant elegance in the letter-press of many modern books, the splendid whiteness and smoothness of vellum paper, or of hot-pressed woven paper, and the broad margin injudiciously contrasted with the printer's glossy ink, are ill calculated to preserve our eyes. And if the lines be too close to each other, the columns too long, as in our newspapers, the ink too pale, as is now becoming fashionable, and the paper of a bluish cast—

the eyes are then in a fair way of being totally blinded.

I read in the *Gentleman's Magazine* for April, 1794, a proposal, to print on dark blue paper with white letters, or on green paper with yellow letters. This plan certainly deserves a fair trial, though it might meet with great difficulties in the execution.—The eyes would also be greatly preserved, by making use of a fine light blue writing-paper, rather of a greenish tint, instead of the fashionable white or cream-coloured paper.

Every exertion of the eyes is most hurtful immediately after a meal, as well as at any time when the blood is in great agitation.—In the dawn, in twilight, and in moonshine, we ought not to read or write, nor direct our sight too attentively to objects.

Refracted rays afford an unpleasant light, and oblique rays are particularly painful. When we take exercise in a long, irregularly-lighted apartment, we feel sensible vibrations in the pupil of the eye. The most suitable apartment, in this respect, is one forming a regular square, with large windows to the east, in which there is an uniformly-divided light, or still better by means of sky-lights. Garret windows afford a bad light; it being generally introduced, as it were, by a funnel, and illuminating only one part of the room, while the rest remains dark.

A sitting-room is best adapted to preserve the eyes, the walls of which are pale green, without paintings; two or three uniformly high windows, so as to give an equal light; (yet so contrived as to prevent its being too

strong) close and moveable green blinds; a green carpet on the floor; and, lastly, such shutters as may occasionally leave the upper part of the window uncovered, in order to admit sufficient light—To sit with the back to the window, occasions a shade which forms a disagreeable contrast to the surrounding light. The writing-desk, therefore, ought to be placed so, that the left window may be on the left hand, and that the right hand may throw no shade on the paper, and not too near a corner of the room, as this generally has an unfavourable light. A space sufficiently broad, between two windows, is a still more convenient situation for a desk; but we should not sit too near the wall; a custom which is excessively hurtful to the eyes.

An oblique position of the desk is the most proper; for it presents to us the writing materials in that position, in which we are habituated to place a book, when we hold it in our hands, and from which the rays of light diverge more gradually than from a horizontal table. It is less hurtful to the breast, to the abdomen, and also to the eyes, to use a desk of this form, and to write standing rather than sitting; provided that the height of the desk be proportionate to the length of the body, that it stand firm, and that both arms rest upon it, without being fatigued by raising them too high—In *standing* before a desk, we have this additional advantage, that there is less occasion to direct the eyes upwards, than in sitting. Hence the conversation between tall persons and those of a low stature is most

troublesome to the latter, as they are constantly obliged to look upwards.—Those with whom we converse ought not to stand between our body and the light, as it is both rude, and prejudicial to our eyes.

At night we ought to place the candle so that we may receive light from it in the same direction as we do from the window in the day-time. Even if it be provided with a green screen, as before described, a weak eye will not long be able to support its glare in a straight line. Were the candle to be elevated at our back, so as to allow the light to come down over our shoulders, we should then experience the same inconvenience, which attends that posture in day-light. Hence it is necessary to place it sideways, and to keep the book or paper in a lateral direction.

We should not expose ourselves in a straight direction to objects strongly illumined by the flame of a candle, or fire from a grate. Thus the highly-polished fenders and other fire-irons are injurious to sight ; and not less so is a smooth and shining wax-cloth over a table, as refracting too much the rays of light : a green cloth is preferable. In all cases, the light should at least be of equal height with the forehead ; not close to a white wall, and still less before a looking-glass or other polished body. To walk up and down a room lighted with a single candle, so that at one time we have the light full in our eye, and at another are nearly in darkness, is very prejudicial to weak eyes. It is better to place the candle in the middle of the room, in order to illumine it more uni-

formly, or, what is still preferable, to hang it higher than the shade of our own body.

Where persons must have a light during the night, it ought to be placed in the next room, or at least within the chimney, that it may be entirely out of sight. If neither of these methods be convenient, we should place it behind or at the side of the bed, rather than in an opposite direction. For, if this be not attended to, the light may produce very noxious effects during sleep, even through the closed eye-lids. The same attention is required, to prevent the rays of the sun or moon, either directly or by reflection from the opposite wall, from striking the eyes of the person asleep.—As some men are known to sleep with their eyes open, it would be advisable to employ somebody to shut them, that they may not suffer by the accidents before mentioned.

Those who have weak eyes should carefully avoid strong fires and even hot rooms; for heat still more dries the eyes already suffering from want of moisture. Indeed, it is highly probable, that the weakness of sight and early blindness, so common in this country, are in a great measure owing to the bad custom of hastening to the fire-side, whether coming from the cold air, or from the dark streets.

Weak eyes must be indulged with shady places, and protected against every dazzling object. But green arbours should be avoided, on account of the twinkling light occasioned by the agitation of the leaves. The exercise of the eyes ought never to be suspended for any considerable length of time: too much rest

is hurtful ; and to sit whole hours of the evening without candle-light, is extremely pernicious. It is, however, very soothing to the eyes, to let them rest for half an hour during twilight. This should teach us to adopt the general and salutary rule, to rise with the dawn, and gradually to accustom ourselves to the artificial light of the evening. For a similar reason, those who complain of weakness of sight, ought not to resort to places artificially lighted in the day-time, such as theatres, &c. Even the soundest eyes must inevitably suffer by a sudden change from light to darkness, or from darkness to strong light.

If it become necessary to let the eyes rest, we should by no means press the eye-lids too closely together, which if long continued, is very hurtful. So is strong and frequent friction, which powerfully stimulates the nerves and injures the eyes. If we sit for any length of time with closed eyes, we are easily overtaken by sleep, which, though beneficial, ought to be of short duration, that the eyes may not be overheated. As a protection against injury from external causes, it is most useful to wear a shade at such a distance, as may allow the eye free motion, and not keep it too warm. The green veils worn by ladies are, in this respect, well calculated to prevent the dust from entering the eye, as well as to protect it against cold winds, and the burning rays of the sun.

The common eye-cases, used by travellers, and by artificers who work in substances abounding with dust, are, for the following rea-

ions, improper : 1. the glass in the case stands too prominent, and diminishes the horizon ; hence, as those who wear them cannot see sideways and downward, but only straight forward, they travel unsafely on an uneven road ; 2. the glass in these cases being easily covered with vapour, both from internal perspiration and external cold, prevents distinct vision. These eye-cases might be much improved by making the brim somewhat narrower, and substituting a fine silken gauze, or rather a thin plate of ivory, dyed green, with a small horizontal incision, in preference to glass.

All glasses used to assist vision appear to require some effort of the eyes, and, unless they be indispensable, they should never be employed by persons at an early time of life. In proof of this assertion, I shall only remark, that by looking through a window of the finest glass, we feel our eyes much more fatigued, than if the window had been open. This is particularly the case in looking through coach-windows, where additional injury is occasioned to the eyes, by the motion of the carriage, and the impure air arising from respiration. Green curtains in coaches are, therefore, judicious and proper.

Of all the remedies for preserving weak eyes (for diseased eyes require professional assistance,) bathing them in pure cold water is the most refreshing and strengthening. But this ought not to be done above three or four times a day ; otherwise it has a tendency to give an unnecessary stimulus to the eyes. Nor should it be done immediately after rising in the morn

ing, but only when the moisture, which during sleep is deposited even in the soundest eyes, is nearly evaporated. This partial cold bath may be repeated after dinner and supper, at which times the eyes stand as much in need of it as in the morning. Not only the eyes, but also the brow, the region behind the ears, sometimes the whole head, and particularly the upper lip, which is closely connected with the optic nerves, should be bathed or washed as well as the eyes. In the morning, the eye ought not to be precipitately, but gradually exposed to the water : and the washing should be expeditiously performed. In drying or wiping the eye, we should proceed gently and with caution ; and immediately after washing, we should particularly guard against any rays of light, as well as every kind of exertion.

A large piece of sponge, containing a good deal of water, so that it may not too soon become warm, is far preferable in these partial bathings, to the warm, smooth hand, or towel. The sponge should be frequently dipped into cold water, and occasionally allowed to lie for a few moments on the eye, with the head bent backward, while the eye is generally moved and a little opened during the operation.

The bathing of the eyes, in small glasses, is less advantageous, as the water very soon turns luke-warm, and is perhaps too cold, when suddenly renewed. These glasses occasion another disagreeable sensation, as their edges will, in some degree, attach themselves to the skin, not unlike cupping-glasses.

The cold bath, under certain restrictions, is useful ; as it invigorates the whole body, and consequently strengthens the eyes ; but in some cases it may injure them, by propelling the blood too forcibly to the head. This may, in a great measure, be prevented by not only washing the eyes and the whole head previously to entering the bath, but also by diving the whole face and head under water.

V. *Dietetical Precepts respecting the Eyes in general.*

ABOVE all things, we must observe the old rule ; to try carefully what best agrees with us, and to attend to moderation and regularity in our manner of living.

Smoking tobacco, and taking snuff, are injurious ; as by either practice the eye is too much stimulated. It is a vulgar error, that people cannot resign these improper habits, without injury to their health. They may be safely abandoned at once, though occasionally prescribed as medicines.—Tobacco* has only been known in Europe since the beginning of the seventeenth century, and was long merely

* The tobacco-plant was first discovered growing wild in South America ; in the year 1496 it was also found in Saint Domingo ; in 1520 in Jucatan ; from which last place the first seeds were brought over to Portugal in 1560, by the French Ambassador *Nicot*, who gave it its present name from the Island of *Tobago*, where it grew in great abundance. Hence *Linnaeus* calls it by the compound name of *Nicotiana Tabacum*.

used as a luxury. This plant is now much abused ; and those who are once accustomed to it, cannot leave it off without great resolution. To such persons it does not afford relief as a medicine ; their olfactory nerves having become almost insensible to its stimulus. As a medicinal remedy, it serves to draw superfluous humours from the head ; but in those who use it extravagantly, especially in snuff, it imperceptibly weakens the nervous system, and especially the memory.

After meals, and the above-stated bathings, it is beneficial to the eyes to remain in the open air, to direct our looks to a grass-plot, or to divert them with some amusing employment.—Some have observed, that their eyes are not so strong after they have eaten weak soups or broths, as after solid food : they further affirm, that their sight is stronger after a meal consisting entirely of vegetable aliment, than after a very moderate portion of animal food. These observations are far from being unimportant, and, if fully confirmed by experience, they may throw some light on the dietetical treatment of the eyes—a branch of medicine that has hitherto been too much neglected.

A short sleep after dinner can only be beneficial to the eyes of those, with whom this practice does not disagree ; at all events, the eyes ought to be protected from day-light, which would hurt them more than they can be refreshed by a short slumber.—The particular rules respecting this practice, I have stated

in the Seventh Chapter.—The steam of boiled coffee, gently applied, has also been recommended after dinner to persons afflicted with weak eyes; but nothing has a more salutary tendency, in this respect, than to go to bed at an early hour; for most people impair their sight by heavy suppers and heating liquors, so that their eyes remain inflamed till next day. The same, indeed, is also the case with those who indulge too much in sleep.

A pure, serene air is an essential requisite to the preservation of the eyes. Fetid exhalations sometimes instantaneously affect the eye; hence we should avoid the putrid effluvia from marshes and ditches, or other places in which the air is filled with noxious vapours; for instance, the vicinity of colour-shops, hartshorn-distilleries, and the like. It is, perhaps, unnecessary to point out every species of mephitic vapours to be shunned as the enemies of sight; yet it deserves to be remarked, that the exhalations of stables are injurious, while the stalls, and other places where cattle are kept, are far less hurtful. Lastly, the galleries of churches, as well as the higher boxes and galleries of playhouses, are most pernicious places; for the exhalations, ascending from a great number of people assembled below, are extremely detrimental to sight.

On the other hand, the frequent enjoyment of a pure and fresh air, the occasional resort to elevated situations, nay, even the exposure to a moderate wind, are means of improvement. The more vigorous species of bodily exercise also, are in a certain degree useful; provided

we do not exert the eye by reading, writing, &c. before the circulating fluids are reduced to their proper medium.—The application of electricity, which has benefited many weak eyes, by its fluid being conducted through a wooden point, is somewhat analogous to the going and standing against the wind ; as it probably operates more by the gentle vibrations of the air, than by the communication of the electric fluid itself.

To read in the open air is hurtful to sound, and still more to weak eyes, unless the light of a clear day be modified at least by the foliage of a tree from above ; yet even here the vivid light surrounding the book is fatiguing.

The greater or less interest we take in our employments, is of considerable importance to the organs of sight ; particularly if they be in a weak state. The more alluring a book or any other amusement is, the longer we are induced to continue it. Hence the important rule : to reserve the most interesting labours for the half-wearied eyes ; yet, with prudent severity, always to appoint a task ; for, without this precaution, the sight, though at a later period, will inevitably experience more or less injury from such practices.

The state of the weather has great influence on the power of vision ; hence persons troubled with weak eyes should not be alarmed, if in a tempest or thunder-storm, in rainy, or foggy weather, their sight be less acute, or even much impaired.—Such individuals are easily affected by standing too long on cold or damp ground, by a too light dress, and particularly by a too thin covering of the legs and feet.

Riding on horseback is beneficial to weak eyes, as is also walking and riding in carriages. The principal advantage in all these exercises is, perhaps, derived from employing the eye with a great variety of objects, none of which occupies the attention too long.

Lastly, persons having black eye-lashes generally possess greater powers of vision, than those whose eye-lashes are of a light colour; because the former are a better screen for the eye, and reflect no light from their outside, by which the image on the retina would be rendered weaker and more indistinct.

MONTALDUS gives an account of a person whose eye-lids and eye-lashes were completely white; who consequently saw but indifferently in the day-time, but much better in the evening and at night. This man happened to be taken prisoner by the Moors, who dyed his eye-lids black, by which his sight was much improved: but, as soon as the colour was lost, his vision also became weaker.

Dr. RUSSELL mentions, in his "*History of Aleppo*," that the Turkish ladies usually dye the inner side of their eye-lids black, not so much for the sake of ornament, as with a view to strengthen their sight.—It has farther been observed, that when we lose the eye-lashes, as is often the case in the small-pox, the sense of vision is thereby considerably weakened. For a similar reason, the hair combed down the forehead, if of a dark colour, will assist the sight, as well as any other contrivance over the brow.

VI. *Some additional Rules, addressed to those who are obliged to make use of Eye-glasses.*

THE cases in which eye-glasses may be used with advantage, are nearly the following: 1. when we are obliged to hold small objects at a considerable distance, before we can distinguish them: 2. when, in order to discern objects, we require more light than usual; for instance, when we are obliged to place a candle between the eye and the object; for this is one of the most destructive practices, by which the optic nerves and muscles are much injured;—and, as the eye employs itself with the object in proportion to the degree of light reflected upon it, the pupil ought to dilate accordingly; instead of which, it is forced to contract, on account of the too powerful light produced by the intermediate candle: 3. when a near object, upon accurate and attentive examination, becomes obscure, and begins to appear covered, as it were, with a mist or fog: 4. when, in reading or writing, the letters seem to flow into one another, and look as if they were double or treble: 5. when the eyes are easily fatigued, and we are obliged from time to time to shut them, or to direct them to fresh objects, for temporary relief.

In the choice of spectacles we need not attend so much to their magnifying power, as to the circumstance of their agreeing with our sight; that is, when they enable us, clearly and without exertion, to see at the same distance, in which we formerly were accustomed to read or work. Hence we ought out of

a number of glasses to choose those, which afford the best and clearest light in every state of the eye. But, if a person be short-sighted, he should choose a second glass, magnifying a little more than the other, but somewhat less distinct, yet so that it may not obscure the object. This is unpleasant at first, but the eyes in time become accustomed to it, and daily improve. If, after some time, we make use of less concave glasses, there is no doubt, that in the course of a few years, according to particular circumstances, the defect of short-sightedness may be gradually removed.

He who observes this regular gradation with his spectacles, may preserve his eyes to the latest period of life. But we should not make these changes too suddenly, lest the aid of art be too soon exhausted, and the wearer of glasses perhaps be unable to find any of sufficient magnifying powers. It is farther a hurtful practice, to use any other but our own glasses, to which the eye has been accustomed;—every irregularity is injurious, and the preservation of the eyes depends chiefly on uniformity, with respect to glasses as well as to the light, in which the organs of sight are exercised.

In using one glass only, people accustom themselves to neglect one of the eyes; and, on this account, spectacles are preferable. Yet both glasses must be separately fitted to each eye, and by no means indiscriminately used; for this would increase the disease.—If, however we make use of one glass only, each of the eyes ought alternately to be habituated to it.

Many persons wear glasses in the evening, and can dispense with them in day-light. This

is rather an imprudent practice ; and, if it be not too late, they should choose a second pair of glasses, somewhat more magnifying, and to be used by candle-light only. In this manner, the retina would receive an equal proportion of light, at one time as well as another, and the eye longer preserve its vigour.

Green glasses are said to be most suitable to the eye, since they modify the impression of light on the retina. Though this be in a great measure true, they cannot be indiscriminately recommended, and certainly not to such as have weak eyes. Green is indeed pleasing to the eye, more than any other colour, but, at the same time, it somewhat obscures objects, especially at first. Those of a vigorous sight only should make use of them as preservatives, especially against the fire or candle-light. But, if white or light-coloured objects appear red, after having used green glasses for a short time, we should discontinue their use ; as this phenomenon is a certain proof, that they will in the end destroy the eyes. If the green colour does not in two or three days become imperceptible, but appears constantly upon the paper as it did at first, it is a farther criterion that the use of them is improper.

Many give the preference to large reading-glasses ; in order to avoid wearing spectacles. It is however obvious, that it must be a pernicious practice, to keep the eyes in constant exertion, as is the case here, where every motion of the hand and the head necessarily alters the distance. In addition to this inconvenience, the dazzling splendour of the rays, reflected from the surface of the glass, weak-

ens the eye to such a degree, as to render the use of spectacles ultimately indispensable, with this only difference, that the eyes require greater magnifying powers, than might have been necessary without this depravation.

Hence spectacles are in every respect preferable, as they are not only more conformable to the nature and mechanism of the eye, but also more convenient: they are uniformly placed before the objects by the imperceptible motion of the head; they leave the space between the object and the eyes open and free; and being generally thinner, and lying at an uniform distance before the eye, they present the objects more clearly and distinctly than reading-glasses.

Those who have weak eyes, ought not to employ themselves, even occasionally, in a manner that may be fatiguing to the sight. Particularly hurtful are those occupations, in which one eye only is exerted, and must consequently be placed in positions, different from those of the other eye, which is at rest. For this reason, the use of magnifying glasses, of whatever kind, is more pernicious to weak eyes, if we always use the same eye, and purposely shut the other, than if we alternately make use of either. On this account, microscopical investigations are less hurtful, if, while one eye be employed, we can keep the other open.

We should not make too frequent trials to discover, whether we have improved in sight, or not; for the exertion necessary upon these occasions, is uncommonly stimulating and fatiguing.

Spectacles ought to be used only for the purposes for which they are designed ; namely, in such employments as require the assistance of art, and where the eye is always kept at an equal distance ; for instance, in reading or writing. We should not without a full trial make choice of a pair of glasses, nor be satisfied with those which, at first, exhibit the objects clearly and distinctly. For objects will not always be at the same distance before us as they appear at the first experiment. It would be proper to try a pair of glasses for a short time, especially by candle-light ; to use them in that posture of the body to which we are accustomed ; and, if with the usual kind of labour, we do not feel our eyes fatigued, but rather somewhat relieved, we then ought to adopt these glasses. But, as it is almost impossible to meet with a pair of glasses in the shops, which fit both eyes, there is nothing more absurd, than to purchase spectacles ready made. Certain as it is, it may not be generally known, that there is perhaps not one person among thousands, whose eyes are both of an equal size and constitution. For this reason, different eyes should be accommodated with different glasses ; and, if we consult our interest in an affair of such consequence, we shall be cautious in selecting for each eye a proper glass. The following advice is submitted to those who have no optician at hand :

Short sighted persons, who wish for a proper concave or magnifying glass, may take the exact focus, or point of vision, by presenting the smallest print very close to the eye, and

gradually removing it, as far as they can read the letters distinctly, and without much exertion. When they have accurately ascertained the focus, after frequent trials, let them employ another person to take the measure of this distance, with a slip of paper, in the nicest possible manner. An optician, on receiving this measure, and being informed at what distance the glasses are intended to be used, will be able to judge, in a certain degree, although by no means so accurately as by a personal conference with the short-sighted person.

Such as observe their eyes to be inclined to far-sightedness, may proceed exactly in a similar manner. But all eye-glasses ought to be furnished with double joints or springs; as those with single joints are not only inconvenient on the nose, but what is worse, they are apt to shift the point of vision with every motion of the head, and consequently injure the eyes.

Lastly, in such occupations as require a more or less extended view of the objects, for instance, in playing at cards, where the distance of the objects must be frequently varied, it would be extremely injudicious to use spectacles; as no eye whatever can bear such exertions, without uncommon fatigue. For a similar reason, it is hurtful to these important organs, to keep the spectacles on the head at close work, when by some accident we are obliged to search for something dropt, or mislaid. Thus we force the eye to make uncommon efforts, in seeing farther than it is enabled to do, by the construction of the spectacles. I need not observe, that many good eyes are spoiled by such imprudent practices.

CONCLUSION.

THE preceding Chapters contain the principal outlines, relative to the treatment of the human body in a healthy state, so far as the limits of this work would admit, without transgressing too much on the indulgence of the reader.

I shall conclude with a few general reflections, and recapitulate, in a concise manner, several useful precepts, which have been more fully laid down in former parts of this work.

Moderation, in every respect ought to be the first and leading maxim of those who wish to live long and enjoy health. Extremes, in the most opposite things, frequently border on each other. The greatest joy may occasion the most acute pain ; and, on the contrary, moderate pain is often accompanied with feelings not altogether disagreeable. The highest animal gratification, indeed, is closely connected with disgust, and it is difficult to avoid the latter, after the enjoyment of the former. Hence prudence enjoins us to restrain violent sensations and affections, before they have attained the highest degree.

The illustrious MEAD, in his “ Medical Precepts and Cautions,” originally written in Latin, when treating of the affections of the mind, makes the following remarks, the truth of which has induced me to insert them :

“ All mankind,” says that medical philosopher, “ have a natural desire for the enjoy-

ment of pleasures, which are of two different kinds, namely, the sensual and mental.—The former engrosses the greatest part of men, while those few only “whom kind Jove has befriended,” are captivated with the charms of intellectual pleasure. The reason why so great a proportion of thinking beings indulge in sensuality is obvious : it proceeds from being unacquainted with the serenity of mind resulting from a dignified conduct, and the joy that animates a good man, when his reason presides over his passions. But the sensualist, being devoted to grovelling enjoyments, is incapable of relishing the real charms of Virtue, and the superior beauties of Nature. The man who wishes to enjoy true happiness should habituate his mind to cherish Virtue, and carefully avoid the opportunities which excite and inflame the passions.

“CICERO illustrates this by a sentiment of CATO, which he received from the great ARCHYTAS, of Tarentum ;—“that Nature never afflicted mankind with a more destructive disease than the pursuit of bodily pleasure, which stimulates to enjoyment with ungovernable rashness.”* Indeed, the perusal of that great philosopher’s writings, on this subject, must delight the mind of every rational man : and Virtue’s exclamation, in SILIUS ITALICUS, is equally just and impressive :—

“Pleasure, by gliding on the minds of men,
 “More mischiefs hast thou wrought than hostile arms,
 “Than all the wrath of Gods !”†

“As the rational subjugation of the passions strengthens the mind, so *temperance in diet*

* *De Senectute*, cap. xii.

† *Panistorum*, lib. xv. v. 94.

renders the body less subject to these turbulent emotions. And this observation is applicable not only to individuals who are naturally of a hot constitution, but even to those who control their appetites; because moderation is a great means of tranquillising the mind."

Cleanliness is a principal duty of man, and an unclean or filthy person is never completely healthy. It is better to wash ourselves ten times a day, than to allow one dirty spot to remain on the skin. On a place where impurities are suffered to clog the pores, not only insensible perspiration, but likewise the absorption by the skin is entirely suppressed; and if the whole body be, as it were, covered with a varnish formed of perspirable matter, it is impossible that a person in such a state can possess sound blood, or enjoy good health.

Many diseases originate from an impure *atmosphere*, but a still greater number from the sudden changes of the temperature of the *air*. Hence the necessity of exposing ourselves daily to such changes, and of renewing the air in the house and apartments we inhabit, by opening the doors and windows every clear morning, or during the day, as often as convenient. Indeed, to encounter cold weather, however intense, has the effect of bracing the fibres of the system in general, and is attended with danger only, when we suddenly remove to a warmer temperature. For this reason, it is extremely injudicious, and a bad compliment paid to a visitor, to invite him to the fire-side, upon his first entering a house; we should better consult his health, by conducting him to a

cold room, or to some distance from the fire, till the temperature of his body be more equal to that of the apartment.

Every thing calculated to remove or cure diseases may also produce them ; for, whatever has a tendency to accomplish useful changes in the body, may, under different and opposite circumstances, be attended with the contrary effect. Hence no *medicine* whatever ought to be used as daily food—a favourite practice among invalids, valetudinarians, and the votaries in quack medicines.

Feeble individuals ought to eat frequently, and but little at a time : the number of meals should correspond with the want of strength ;—for it is less hurtful to a debilitated person to eat a few mouthfuls every hour, than to make two or three hearty meals in one day ; yet this observation is liable to exceptions, respecting those persons who have naturally weak stomachs.

There is no instance on record of any person having injured his health, or endangered his life, by *drinking water* with his meals ; but wine, beer, and spirits have produced a much greater number and diversity of patients, than would fill all the hospitals in the world. Such are the effects of intemperance in diet, particularly in the use of drink ; for neither beer, wine, nor spirits, are of themselves detrimental, if used with moderation, and in a proper habit of body.

It is a vulgar prejudice, that water disagrees with many constitutions, and does not promote digestion so well as wine, beer, or spirits : on the contrary, *pure water* is preferable to all

brewed and distilled liquors, both for bracing the digestive organ, and preventing complaints which arise from acrimony, and fulness of the blood.

It is an observation not less important than true, that by attending merely to a *proper diet*, a phlegmatic habit may frequently be changed into a sanguine one, and the hypochondriac may be so far altered, as to become a cheerful and contented member of society.

The duration of *work* or *exercise* cannot be easily ascertained, with regard to every individual. Generally speaking, we ought to work only when we feel a natural inclination to either literary or mechanical labours. To force ourselves to any exertions, particularly those of the mind, is productive of imperfect performances.—It is better to exercise the mind in fine than in bad weather; but those who are continually making excursions in the former, cannot usefully employ themselves in the latter.

Of the twenty-four hours of a day, we ought, in a good state of health, to devote upon an average twelve hours to useful occupations, six to meals, amusements, or recreations, and six to sleep. This would be at once a natural and arithmetical proportion. It is, however, to be regretted that the hours cannot be thus accurately divided.—An industrious person frequently counts but twenty-three hours in a day; as one and sometimes even two hours slide away imperceptibly.

“Sleep,” says Dr. MEAD, in the sequel of the work above-mentioned, “is the sweet

soother of cares and restorer of muscular energy, which is wasted by bodily and mental exertions during the day. But excessive sleep has its inconveniences ; for it blunts the senses, stupifies the mental faculties, and renders both less fit for performing the duties of active life. The proper time for sleep is the night, when darkness and silence invite and cherish it ; but sleep during the day is less refreshing. The observance of this rule, if proper for the multitude, is still more necessary for persons devoted to literary pursuits, whose bodies and minds are more susceptible of injuries.”

The modern inventions for promoting luxury and effeminacy are really surprising. It were to be wished, that the ingenious contrivers could be persuaded, that their pernicious arts resemble those of the Quacks, whose poisonous productions gradually, though ultimately consume the vital spirits of their victims.—Every new expedient we use, with a design to diminish the labour of man, and encourage indolence, is an additional proof that our age is not in a state of improvement, but rather on the decline. Wretched is the man who requires the aid of Art, more than of Nature, to prolong his life, and to support so precarious an existence!—Conveniency leads to effeminacy ; effeminacy to general relaxation ; and this is eventually attended with total enervation and imbecility.

“ Although pleasure, riches, power, and other things (concludes the author before quoted), which are called the gifts of Fortune, seem to be dealt out to mankind with too

much partiality, yet there is a greater degree of equality of those things which constitute real happiness, than is generally imagined. People in the lower ranks enjoy the common advantages of existence more intensely than those in the higher walks of life. Wholesome food is acquired by moderate labour, which improves the appetite and digestion: hence sound sleep, uninterrupted by corroding cares, refreshes the wearied limbs; a healthy progeny fills the cottage; and the sons perform their father's labour, making his hoary locks sit comfortably on him. How vastly inferior to these blessings are the delicacies of the affluent, which are ever accompanied with real evils. Their appetites, in order to relish their food, must be stimulated by poignant sauces, which heat and vitiate the blood, and render the body liable to distempers. Their excesses disturb their repose; and as a punishment for their vices, their sons, who ought to be the ornament and support of their families, contract diseases from their mother's womb, and are afflicted with infirmities through the course of a languid life, which seldom reaches to old age. They are frequently tortured with anxieties for obtaining honours and titles, inasmuch that they lose the advantages of their possessions, by the vain desire of new acquisitions:

† In wealth like this,

• I always wish to be extremely poor!

Horace, Satire I. v. 78.

“But the worst inconvenience that results from Epicurean modes of living is, that by

supplying the body with superabundant nourishment, the faculties of the soul are stupified, and the passions inflamed ; while the sparing and homely diet of the laborious poor neither oppresses the bodily functions, nor fosters a propensity to vice. Hence, unless prudence be a constant attendant on opulence, it is, in these respects, better and more conducive to the preservation of health and prolongation of life, to live on a small fortune.

“ Nor is Nature to be deemed an unjust step-mother, but a most provident and beneficent parent. In short, it behoves a wise man, in every stage of life,

“ To hold the golden mean,

“ To keep the end in view, and follow Nature.”

LUCAN, Book II. Ver. 381.

“ Whoever investigates the imperfections of human nature will find, that as some men are vastly superior to others in the endowments of the mind, yet, mournful reflection ! even the best minds are blended with some degree of depravity ; so the healthiest bodies are often afflicted with diseases ; and these, being the seeds of death, ought to remind us of the shortness of this life, and that, in the words of LUCRETIVS,

“ None have a right to life, all to its use.”

C O R O L L A R Y.

A LUXURIOUS life, and dissolute manners, not only impoverish a people, but ultimately depopulate the country itself. Such mischievous consequences can be averted only by laws wisely enacted, duly administered, and experimentally adapted to the natural capacity and disposition of a people : for, if their artificial propensities and desires be not controlled in time, and directed to useful ends, the citizen must degenerate into a feeble and irresolute slave, and his progeny will gradually wither away, like a plant in a foreign soil.—Thus Rome was subdued, when she departed from her ancient simplicity of manners, when she adopted foreign and effeminating refinements, and when her feasts and public amusements became too frequent.

T H E E N D.

POSTSCRIPT.

IT has been frequently and justly remarked, that popular books on medical subjects are generally deficient in their practical application; insomuch that they leave the reader doubtful, *whether* and *when* he is to apply for professional advice. As my design, in these Lectures, has not been to lay down particular rules for the distinction and treatment of diseases, but rather for their prevention, and consequently for the preservation of health, I think it my duty to remark here, that a work seems to be wanting, which should impart instruction to general readers, how to distinguish diseases, and how to treat them by a due and strict attention to diet and regimen, as well as to regulate the habits, peculiarities, temperament, and, in short, the whole state of the patient's mind and body :—such a work being a desideratum of the present age.

When I began the revival of these Lectures, for the second edition, I had it in contemplation to give the outlines of a treatise corresponding with this description : but being confined within the limits of a single volume, and conscious that a mere sketch of so extensive and important a work could be of little if any *practical* benefit, I have purposely delayed the pub-

lication of the whole to another year, when a separate volume shall conclude my dietetical labours.

Having treated, in the present volumes of almost every subject that relates to the management of the human body, in its *healthy* state, my next work shall be entirely appropriated to its treatment in a *diseased* state.* It shall comprehend an accurate and clear description of Diseases, together with a plan founded on the rules of experience, how to treat and eventually to cure them, especially those of a chronic nature. The administration of medicine ought, in such a work, to be only a secondary mean of removing disease, as it will be admitted by the most enlightened and candid of the Profession, that, by strictly medical remedies, we can cure *symptoms*, and afford occasional alleviation of pain; but that we cannot effect a favourable change in the nature and progress of a disease, whether chronic or acute, without due attention to food, drink, air, sleep, exercise, or rest, &c.

Hence I hope to be exempt from the charge of presumption, when I venture into a larger field of inquiry than has hitherto been explored by practitioners; for, as novelty is not my object, though I think that too little has been done by professional men, in guiding the unhappy sufferer, and assisting him with those simple remedies which are placed more immediately around him, I shall enter upon

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* The Editor has for some time expected this second volume, with a view to propose it to the public as soon as it is received.

my proposed work with the confidence arising from the importance and utility of the undertaking in which I am engaged.

It is much to be regretted, that the boundaries between safety and danger cannot be perspicuously ascertained in a popular book, without deviating from the usual terms and definitions adopted by medical writers : but I shall not hesitate to avail myself of such familiar phrases and expressions as will render my works intelligible to the generality of readers. To afford a short specimen of this deviation, for which I allege the respectable authority of the late Dr. TISSOT, I have subjoined a few Queries, which ought to be distinctly answered by individuals who consult a physician, whether personally or by letter. Indeed, it is not always an easy or practicable task to form an accurate judgment of the state of a patient, without an interview, let his case be ever so accurately and circumstantially described : yet most of the difficulties will be removed, if the following questions be answered with candour and precision. For, as the success of the medicine entirely depends on a previous knowledge of the disease, this knowledge can, in such cases be derived only from a clear and faithful account communicated to the physician.

General Questions.

Of what age is the patient ?

Had he previously enjoyed perfect health ?

In what manner has he lived—frugally or luxuriously?

How long has he been ill?

How did the disease commence?

Is he disposed to be feverish?

Does the pulse beat strongly or weakly?

Has the patient still muscular strength, or is he much debilitated?

Does he remain the whole day in bed, or alternately walk about?

Is his state the same at all hours of the day?

Is he uneasy or quiet?

Is he troubled with heats or shiverings?

Is he afflicted with pains in the head, throat, breast, stomach, abdomen, thighs, or the extremities?

Is his tongue dry, accompanied with thirst; disagreeable taste in the mouth; nausea; and has he an aversion to, or appetite for food?

Has he any stools, and how often?

Of what appearance and consistence are the excrements?

Does he evacuate urine freely and copiously?

Of what colour and consistence is the urine—is there any sediment in it?

Is he troubled with night-sweats?

Does his skin feel soft and pliable, or dry and parched?

Is there any expectoration, and what?

How is his sleep—quiet or disturbed?

Does he breathe with or without difficulty?

To what mode of diet and regimen has he been accustomed since the commencement of the present complaint?

What remedies has he used, and with what effect?

Has he ever before been attacked with the same malady ?

In female and infantile diseases, there occur circumstances peculiar to the sex and age ;—these, as well as the preceding general questions, require to be attended to, in consulting a medical man.

Queries relative to Females.

Do the menses appear regularly and in moderation ?

Is the patient pregnant, and how long ?

If in child-bed, how was the delivery—successful, or attended with difficulty ?

Were the discharges easy and regular ?

Has the patient a good breast of milk ?

Does she suckle the child herself ?

Is she subject to *fluor albus*, hysteric fits, &c.

Queries relative to Children.

What is the exact age of the child ?

How many teeth has it, and has it suffered much pain in teething ?

Is it ricketty ?—Is it of a stature corresponding with its age ?

Has it had the small-pox—natural or inoculated ?

Has it a large and hard belly, with strong, or emaciated limbs ?

Does it sleep quietly, or start up, grind the teeth, scream, &c.?

Does it discharge worms, and of what kind?

If worms are suspected to exist in the child (and the same observation will apply to adults), it ought to be examined whether some of the following, that is, at least four or five of the principal symptoms (marked with *italics*) concur, which warrant such a conclusion:—viz. Slight cholic pains—frequent discharge of water from the mouth—*fetid breath*—*itching of the nose*—a swollen or chaped upper lip and nose—a ravenous appetite for, or aversion to food—oppression at the stomach—vomiting—*an effort to swallow during sleep*—costiveness, or diarrhoea—*bloody excrements*—*sudden and frequent inclination to go to stool*—a large belly and thin limbs—continual thirst—occasional debility, and sadness—*frequent change of colour*—languid eyes, with a livid hue around them, and standing half open during sleep—terrifying dreams—frequent startings of the tendons—*grinding the teeth*—uneasiness and anxiety—*a milky urine*—palpitation of the heart, fainting fits, convulsions—*a profound and long sleep*—*cold sweats, appearing and vanishing suddenly*—temporary dimness—dumbness, or difficulty of speech—weakness or lameness of the joints—*corroded gums*—*frequent hiccough*—a small and irregular pulse—delirious fits—*a slight and dry cough*—*evacuation of thick, slimy matter*—worms discharged from nitulous ulcers, &c.

Besides the general questions which ought to be made and answered in all diseases, those likewise must not be neglected which more im-

mediately relate to the present affection of the patient. For instance, in a quinsy, we ought to be informed of the particular state and condition of the throat :—in diseases of the breast, the seat of the pain, the straitness of the chest, the nature of the cough, and expectoration, should be distinctly mentioned. It would be useless here to enter into farther particulars, as the intention of these questions must appear self-evident to every intelligent reader : and although the queries appear numerous, they may be easily answered, and in as few words as they were formed.

The immortal Tissot observes, in his valuable work “*On the Diseases of Country-people,*” that it would be a desirable object, if persons of all ranks, in their letters to physicians, were to adopt a plan similar to that above specified, as this would be the means of insuring satisfactory answers, and preventing the necessity of repeating their applications, and explaining the contents of former letters.

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